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We can appropriately consider the treatment of influenzal broncho-pneumonia with that of acute lobar pneumonia, as the broad principles are the same, though there is some difference in details. The usual method of treatment of these diseases has been called expectant, and this should aim at placing the patient in the best environment for his fight and prescribing those measures which will support him until he succeeds or fails in his venture. Such expectant treatment has certainly succeeded better than the active bleeding and purging of an earlier period, but faced with a mortality of 20 per cent. in lobar pneumonia and 30 per cent. or more in influenzal broncho-pneumonia we must acknowledge that we are incompletely equipped and need new weapons. There has, in fact, apart from scientific therapy and improvements in nursing, been no real advance in our treatment since the eighteenth century. In contemporary accounts of an epidemic of influenza in 1782 we find the same discussions concerning the use of Peruvian bark, expectorants, diaphoretics, and opiates as still rage around their modern representatives. Much of our present treatment is merely traditional and without rational basis.

Until some drug is discovered which, in therapeutic doses, will destroy the pneumococcus within the living body recovery from pneumonia can only take place by the patient providing sufficient antibodies to overcome the bacteria and their toxins. It is to specific therapy that we must, therefore, look for aid, and I think that we do not look in vain. Without waiting for serum treatment to become practicable I am convinced that we have in vaccines a means, when used promptly and decisively, of aborting the disease and lowering its mortality. I first treated pneumonia and other acute diseases with vaccines in 1907, and the method which was evolved and was published in the *British Medical Journal*, March 13th, 1915, has borne the test of time and proved equally successful in its application to influenzal broncho-pneumonia during the recent epidemics.

EARLY DIAGNOSIS.

Vaccines, as with other methods of specific treatment, must be used as early as possible. They can give little or no assistance when the infection has been allowed to go on to the point of cardiac and nervous exhaustion. Their object is to control the infection before it gets out of hand, and they should not be used as a last resort in cases which are not doing well under other treatment. When given within the first 24 hours after the onset of fever brilliant results are obtained, but with each hour that passes success is less certain. In this we have an exact parallel with the antitoxin treatment of diphtheria. Pneumonia, influenza, and other acute infections must be regarded as acute medical emergencies demanding prompt action, in the same way that a perforated duodenal ulcer and acute appendicitis are regarded as acute surgical emergencies. The abandonment of expectant treatment in surgery has led to a great saving of life. Few physicians have seen many cases of pneumonia within 24 hours of its onset, but when they can offer as definite assistance as the surgeon they will be called into consultation at a stage when such assistance will avail. Prompt action requires prompt diagnosis. Too often the diagnosis of pneumonia is not made until consolidation of the lung is present. One is commonly told, "This man has been ill for three days with a high temperature, but it was only to-day that he showed signs of pneumonia," as though previously he had been suffering from some other disease. It is also implied that consolidation is a bad thing and that the patient had taken a turn for the worse. This confusion of the disease with one of its pathological manifestations is a great hindrance to early diagnosis. The early symptoms of acute pneumonia are so striking that diagnosis should be possible within a few hours. The initial rigor, the rapid rise of temperature, hot dry skin, the pain in the side, the grunting shallow respirations make up a picture not seen in any other disease. Alterations in breath sounds can be found within a few hours, and I have seen blood-stained sputum within three hours of the onset of fever. With influenzal broncho-pneumonia the picture is not so characteristic, but, although complications may gradually develop in the course of a severe simple influenza, it is more usual for them either to be present from the beginning or after a few days of mild fever there is a rapid rise of temperature and the case takes on a graver aspect. In either disease it should be possible to take prompt measures within 24, or at most 48, hours of the onset. We are given a margin of time in which the issues of life and death are in our hands. If we allow this opportunity to pass, the issue, in so far as it depends upon a conflict with the invading organisms, is mainly beyond our control.

PRELIMINARY AND GENERAL TREATMENT.

Whatever treatment be adopted, certain preliminary measures are fundamental. The patient's fate is mainly decided within the first two days. Much can be done to prevent the onset of symptoms which later we should be helpless to combat. Precise and detailed instructions must be given, especially as most patients are nursed by unskilled relatives. Before all things I would place absolute rest and free ventilation. From the first patients must be kept strictly in bed. Most patients object to use a bed-pan and, unless strict orders are given, it will be found that they continue to get out of bed as long as it is physically possible. Nurses and even doctors do not always appreciate the need for absolute rest. Too much effort is often caused by routine washings and scrubbings, reaching out for the sputum mug and feeding cup, sitting up to cough, &c. When rolling a patient gently over to examine the back one is not seldom told, "Oh, he can sit up all right, he always does so for me!" One garment should be worn and much exertion is saved by slitting this down the middle, and so preventing an agonising struggle to get night-shirt and vest over the arms and head.

Windows should be widely open night and day and the bed unscreened in the centre of the room. The temperature of the room should not exceed 60° and the atmosphere should feel fresh, with air in constant movement. Fresh air is the finest circulatory tonic we possess. But with our care to avoid the close stuffy over-heated room we must not go to the other extreme and expose patients to icy draughts of cold air. During the initial stage and also at the crisis the patient will feel chilly and abundant bedclothes are required, but when the fever is established one sheet and blanket are sufficient. Gamgee jackets are in fashion, and a nurse will probably put one on unless definitely told not to. I fail to see the necessity for wrapping a patient whom we desire to lose heat in cotton-wool. Patients and their friends still think that pneumonia is caused by exposure to cold, and should be therefore

treated by heat. Sleep will be promoted and restlessness allayed by attention to these common-sense details.

A useful routine diet is of milk (citrated if there is vomiting) and albumin water, 5 oz. of each alternately every two hours. Some of the feeds of milk can be flavoured with tea or coffee, or malted milk given instead, and sugar should be added, especially in the form of cane or milk sugar. Water or lemon-water up to four or five pints in the 24 hours, but in small quantities at a time, should be insisted upon. Unless definitely ordered, patients seldom get enough, and one is constantly told by the friends, "We did not like to give him cold water, although he has been craving for it, as we thought it dangerous." The laity still have much faith in beef-tea, especially in one well-advertised and expensive brand which contains three parts of coagulable protein in 1000. For the sake of the flavour a little may be added to the albumin water, but otherwise it should have no place in the sickroom.

The hygiene of the mouth requires constant attention. Dentures should be removed. The mouth should be wiped out every two hours, and if necessary more often, with a rag moistened with a diluted watery antiseptic. Glycerine should be avoided because of its hygroscopic property. A liquid paraffin spray to the nose helps the patient's comfort. Three grains of calomel at the onset, followed by a saline, can be given. Thereafter, if skilled nursing is available, a morning soap-and-water enema can be given, if necessary for constipation, or failing that a dose of sodium sulphate. No drug at present known will control the infection, but a mild diuretic, such as pot. citrat. gr. 30, liq. ammon. acetat. dr. 4, aq. camph. oz. 1, four-hourly, is helpful.

VACCINE TREATMENT.

I know nothing in the whole range of medical treatment so dramatic as the rapid defervescence which follows the injection of a suitable dose of vaccine to a patient suffering from pneumonia or influenzal pneumonia within 24 hours of its onset. The vaccine I have used is made from primary cultures or at most first subcultures. It should not be detoxicated or sensitised. For acute pneumonia the vaccine contains several strains of pneumococci, and for influenzal broncho-pneumonia equal numbers of pneumococci, streptococci, and influenza bacilli. Various formulæ have been devised for this triple vaccine containing different proportions of the three organisms. I know no good reason for this, and have obtained the best results with a vaccine containing equal numbers of each. The important points are that it should be given early and in sufficient amount. In pneumonia I give 100 millions pneumococci to an adult and in influenzal broncho-pneumonia 100 millions of each organism. For a child of 12 to 14, 40 to 50 millions should be given, and to a child of 2 or 3, 10 to 20 millions. These doses have been arrived at after many years' experience, during the earlier part of which smaller doses were used and were found to be ineffective. I have seen much larger doses used with safety as I shall discuss later. When such a dose is used during the first day of the disease in the majority of cases the temperature falls to normal on the following day and no further treatment is required. With each day's delay such rapid defervescence becomes less likely and the dose may have to be repeated. This can be done every 24 hours until the temperature has fallen. When injection is delayed until the fourth day or later little can be expected from specific therapy. Toxins will then have already damaged heart muscle and nerve cells. The object of vaccine treatment is to prevent this damage; it can have no action upon heart failure or nerve exhaustion.

The earliest case of pneumonia I have treated was a man of 40 who at 8 P.M. one evening was working in his garden, apparently quite well. One hour later he had a violent rigor and sent for his doctor who arrived at 11 P.M. His temperature was then 104° F. and respirations 36, he had pleuritic pain and grunting respiration. When I saw him in consultation just after midnight he already had blood-stained sputum. His temperature was then 105°, respirations 38, and pulse 128. I injected 100 millions pneumococci. This was followed by a fall of temperature, which reached normal at 4 P.M. the following afternoon, about 19 hours from his first symptom. For a few days afterwards he had consolidation of two lobes, with complete absence of symptoms. Another early case was that of a doctor aged 53 whom I saw one evening about 12 hours after the onset of shivering. His temperature was then 105°, respirations 36, and pulse 136. There was impaired resonance, with altered breath-sounds and fine crepitations at the base of his right lung. A dose of 100 millions pneumococcic vaccine was followed by a fall of temperature, and when I saw him at 10 A.M. next morning his temperature was normal and the pulse-rate only 68. Again there was the striking phenomenon of a patient with consolidation of a portion of the lung and an absence of symptoms. Many similar cases could be quoted. Of those inoculated during the first day the temperature became normal in 24 hours in 83 per cent. and within 48 hours in 100 per cent. Of cases injected during the second day 57 per cent. had a normal temperature in 24 hours, 71 per cent. in 48 hours, and 93 per cent. in three days. But of those injected on the third day only 20 per cent. were normal in 24 hours, 60 per cent. within 48 hours, and 73 per cent. within three days. In a series of 100 consecutive cases injected for the first time at various stages the following were the results. On the first day, 10 cases with one death. This was in a lady aged 29 who was pregnant at full term and hourly expecting her confinement. She was injected within 24 hours and the temperature fell to 98·4° in six hours. Labour occurred the following day with much difficulty. She had consolidation of nearly the whole of the left lung and a patch at the base of the right lung. For a time the outlook seemed hopeful, but she died from heart failure on the sixth day. This is the only fatal case out of a large number injected during the first or second day. On the second day, 17 cases, no deaths. On the third day, 22 cases with no deaths. On the fourth day, 16 cases with 3 deaths (1 a baby of 12 months, who had always been feeble, and another an adynamic case in a patient of 65). On the fifth day, 9 cases with 3 deaths. On the sixth day, 7 cases with 2 deaths. On the seventh day, 5 cases with 1 death. On the 8th, 4 cases with no deaths; and on the ninth one case with no death. Nine cases had an uncertain date of onset, but were injected late, and 3 died. Out of 49 cases injected within three days only one died, and this was complicated by labour; the remaining 12 deaths occurred in patients injected on the fourth day or later. All these were cases of severe pneumonia, such as are seen in hospital and consulting practice. They do not include the milder cases, so often seen in general practice, which give rise to no anxiety.

It was a natural step from the vaccine treatment of acute pneumonia to that of influenzal broncho-pneumonia. Whatever be the true nature of the primary infection in influenza, there is agreement that the serious pulmonary complications are associated with the presence of streptococci, especially of the hæmolytic variety, and pneumococci, and that the influenza bacillus is commonly if not invariably present. Experience had previously shown that broncho-pneumonia of other origin would also yield to vaccine treatment. Influenzal broncho-pneumonia during an epidemic period, however, resembles lobar pneumonia in that an active stock vaccine can be prepared for immediate use, whereas with other broncho-pneumonias some time is lost in discovering the nature of the infection.

The result of vaccine treatment of influenzal broncho-pneumonia can be illustrated by the records of 107 hospital patients injected during the first five days of their illness. These patients suffered from the severe type of the disease, and the term broncho-pneumonia is used to include a variety of pulmonary lesions—bronchiolitis, extreme congestion, collapse, œdema, pleurisy, and consolidation. Many had severe con-

fluent broncho-pneumonia and others would be more rightly classified as influenzo-pneumococcic or streptococcic septicæmia. Several were admitted in a seemingly hopeless condition, and many had the characteristic heliotrope cyanosis. Of the 107 cases, 28 were injected on the first day of their illness, 23 on the second day, 22 on the third, 20 on the fourth, and 14 on the fifth. I give the results in tabular form:—

Day of first injection.	Cases.	Recovered.	Died.	Temperature normal in—	
				24 hours.	48 hours.
				Per cent.	Per cent.
1st	28	28	0	71·4	85·7
2nd	23	22	1	47·8	56·5
3rd	22	20	2	50·0	72·7
4th	20	15	5	30·0	40·0
5th	14	12	2	35·7	63·5
—	107	97	10	50·0	65·0

The only death of 51 patients injected within the first two days of their illness occurred in a young woman of 29 who was admitted on the second day with violent mania and extensive broncho-pneumonia. She shouted and struggled incessantly. The first injection of vaccine was followed by a fall of temperature to normal in 36 hours, and the patient became more rational, but she died unexpectedly on the ninth day from pulmonary embolism. Seven out of the 10 deaths occurred in patients who were not injected until the fourth or fifth day. Four were complicated respectively by mitral stenosis, advanced pregnancy, meningitis, and asthma, and three others had considerable albuminuria. The 10 deaths give a rate of 9·1 per cent.

Analysis of the results emphasises the importance of early treatment. Whilst 71·4 per cent. injected on the first day had a normal temperature within the following 24 hours and in some there was complete defervescence in 12 hours, on the second day the percentage had fallen to 47·8, on the third day to 50, on the fourth day to 30, and on the fifth day to 35·7. Of the total 107 cases, the temperature fell to normal within 24 hours in 50 per cent. The youngest patient, a baby of 3 months, was admitted with a temperature of 104·2°, respirations 60, and a pulse of 160 or more. Two doses of 7½ millions vaccine were given with complete recovery. Another baby of 9 months, with a temperature of 104°, respirations 60, and pulse 164, was injected on the fourth day with 10 millions and the temperature fell to 99° in less than 24 hours. The oldest patient, a man of 73, was given 60 millions on the first day and the disease was aborted.

These effects of early vaccine treatment in aborting the disease are not peculiar to pneumonia. They can be seen with cerebro-spinal fever, typhoid fever, and streptococcic septicæmia, when early diagnosis is possible. We appear to be dealing with a general principle capable of wider application when we more thoroughly understand the mechanism of immunity.

The chief obstacle to the general use of vaccines in acute disease has been the fear of producing a negative phase. Hence when vaccines are used it is too often in ineffective doses. The theory of the negative phase was evolved from the study of cases of chronic localised infections. Under such conditions the patient is "sensitised" and the injection of a small dose of vaccine may have a profound result. But in pneumonia the patient is not in the same state of sensitisation, and after quite large doses of vaccine there is no evidence of a negative phase. Although I have found 100 millions to be a sufficient dose when an active vaccine is used, I have seen much larger doses given. Recently, I saw in consultation a stout middle-aged man who, after four days' mild influenza, developed broncho-pneumonia with a temperature of 104·5°. His doctor injected him by mistake with 1 c.cm. of the mixed anti-influenza vaccine (St. Mary's Hospital formula) containing 1000 millions pneumococci, 500 millions *B. influenzæ*, and 100 millions streptococci, the full dose for prophylaxis. I saw the patient 11 hours later; his temperature was 101°, he had lost his distress, and was distinctly better. He had a good night and next morning had a normal temperature. This unintentional experiment, I think, supports my contention that there is no clinical evidence of a negative phase after injection of quite large doses of vaccine during the early stages of pneumonia. In typhoid fever the same fact is seen, for whereas the usual initial dose is 250–300 millions some authorities give as much as 1000 millions increasing to 2000 millions of an ordinary, not detoxicated or sensitised, vaccine.

Those unfamiliar with vaccine treatment are apt to think that whilst large doses can safely be given to patients with chronic disease acute infections must be treated with very small doses. But the contrary is the fact; the treatment of chronic infections should be cautiously commenced with quite small doses. It is easy to produce severe reactions with small doses in patients suffering from chronic bronchitis, asthma, arthritis, pyelitis, chronic septicæmias, and similar conditions, in all of which we are dealing with sensitised persons.

It is difficult at present to give a satisfactory explanation of the striking effect of vaccines in pneumonia. We know that in this disease antibodies are produced late and cannot be found in the first two or three days. It may be that the dead bacteria are more easily utilised as antigen than the living organisms owing to the latter producing aggressins which interfere with antibody production. The action differs from that produced by intravenous injection of a foreign protein in that there is no rise of temperature and no rigor. At the same time the action of a vaccine does not seem to be so highly specific as that of a serum, for in my earlier cases a vaccine made from a single strain of pneumococcus produced results not appreciably different from a polyvalent vaccine containing typed organisms. Vaccines made from primary cultures are more powerful than those made from subcultures, and it seems to be of more importance to have an active vaccine rather than one less active but containing all the types of pneumococci. I have found no advantage from using detoxicated vaccines. There is no object in using a dose of 1000 millions of a detoxicated vaccine when a dose of 100 millions will produce the same or a better result. Rosenow has used autolysed pneumococci in doses of 20 billions, but in 24 patients injected on the first day only five had a crisis on the following day, and the average duration of fever was 3·5 days. There is much evidence to show that a vaccine in which the organisms have been as little altered as possible in process of sterilisation has great advantages over others.

SERUM TREATMENT.

Many attempts have been made to make a satisfactory anti-pneumococcus serum. Cole and his fellow-workers at the Rockefeller Institute have succeeded in obtaining an effective serum against type 1 pneumoccoci, but it is highly specific and useless in infections caused by the other types of pneumococci against which, so far, no effective serum has been obtained. Unfortunately, these latter types are responsible for two-thirds of the cases of pneumonia and two-thirds of the deaths. Before serum can be used in the treatment of a patient the type of infecting organism must be determined, and this requires access to a well-equipped laboratory and a delay of 12 to 24 hours. The serum must be given in large amounts up to 250 c.cm. or more, and it is injected intravenously. The injection of this large amount of foreign protein is frequently followed by general constitutional reactions. There may be a rise of temperature of 3°, rigors, difficulty in breathing, and cyanosis, quite apart from the danger of anaphylaxis in patients already sensitised to horse serum. To avoid this danger an intra-dermal skin test should be performed, and if positive the patient must be desensitised. A week or more later there may occur the group of symptoms called serum disease, comprising fever, skin rashes, œdema, pains in the joints, and glandular enlargement. Reports on the use of serum in type 1 pneumonias show a considerably reduced mortality. Cole in 107 cases had a mortality of

7·5 per cent.; Nichols in 63 cases a mortality of 8 per cent.; Greenway, Bœttiger, and Colwell in 125 cases 5·6 per cent.; and Tenny and Rivenburgh 14·7 per cent. in 68 cases. As with vaccine, the earlier the serum is injected the better the result, and it is of doubtful value in patients who are very ill in the later stages. Anti-pneumococcic serum is not antitoxic and is not comparable to anti-diphtheritic serum. It does not appear to have the same rapid effect as vaccine treatment given in the early stages. Apparently the amount of antibodies which can be supplied artificially is less than that formed by the stimulation of the antigen in a vaccine unless excessive doses of serum are injected. Although serum treatment may become more practically useful in the future, in my opinion vaccine treatment gives more decided results and is free from the unpleasant and even alarming immediate and late effects often seen after the injection of serum.

FOREIGN PROTEIN THERAPY.

Attempts have been made to abort pneumonia by the injection of foreign proteins such as milk, typhoid or gonococcic vaccines, phylacogens, peptone, &c., either intramuscularly or intravenously. Small series of cases have been reported, and they show that the immediate thermal reaction is often followed by general improvement and signs of beginning resolution. But the thermal reaction was often severe and even violent, and it does not seem justifiable to use these methods when better results can be obtained without these disadvantages.

SYMPTOMATIC TREATMENT.

In the early stage the relief of pain and sleeplessness is important. Leeches, when they can be obtained, give quick relief to pleuritic pain. Light and frequently changed linseed poultices are also useful, but must not be allowed to embarrass breathing. Considerable muscular energy can be expended by raising a poultice weighing 2 lb. or more on the front of the chest forty times a minute. Care must be taken that the poultices are not kept in place by a tight binder, as is often the case when applied by the unskilful. Antiphlogistine answers the same purpose, but it is not unusual to see badly scarred chests after its use. In a few cases with very severe pain I have separated the pleural surfaces by the introduction of a small quantity of oxygen. This is not difficult to those accustomed to artificial pneumothorax treatment, and I was favourably impressed with the immediate relief given. Counter-irritation in lobar pneumonia should not be continued after pain has been relieved, but in influenzal cases with much congestion and bronchitis it can usefully be continued. Ten grains of Dover's powder in a saline draught will relieve both pain and sleeplessness. Paraldehyde is probably the safest hypnotic, and can be given in doses of 1 or 2 dr. in very sweet tea. But its highly nauseous taste does not add to the comfort of the patient and makes food distasteful. Opium has been regarded with disfavour, but its use in the early stages of lobar pneumonia and later when there is firm consolidation, so long as there is no interference with the air entry into the other portions of the lung, is quite safe. In influenzal cases more care is required. In those with definite areas of broncho-pneumonia and absence of bronchitis or œdema it may be given for the first two or three nights, but in the diffuse cases with general bronchitis or bronchiolitis, œdema, or cyanosis it should be withheld. In the severe cases with great excitement and struggling and in post-critical delirium hyoscine is the only drug which is likely to be effective. It should be given in doses of one-hundredth of a grain hypodermically. Although it has been much condemned, my experience with it has been fortunate. When it is ineffectual we may be compelled to give morphia as well, in which case it should be combined with atropine.

Bronchitis kettles are not often seen with pneumonia but are used by some practitioners with influenzal broncho-pneumonia. The effect of saturating the air with moisture cannot be good for a disease in which the sputum is usually abundant, frothy, and watery. In cases with much bronchial secretion atropine may give great relief. If 1/100 gr. does not give the desired effect it may be increased up to 1/30 gr. and repeated four-hourly for a few doses. But in the grave cyanotic influenzal cases with much respiratory embarrassment I have found the most helpful treatment to be ammonium carbonate 10 gr. in a teacupful of milk every hour for six doses, repeating the course if necessary after omitting the drug for a few hours. This should *not* be given in lobar pneumonia.

It will be found in text-books that much space is devoted to the treatment of heart failure, but you will not find that any two text-books agree as to the remedies to be used. The fact is that though much can be done by early specific treatment, strict insistence upon absolute rest from the first, fresh air, and avoidance of overfeeding to prevent heart failure, we can do very little to treat it when present. Heart failure does not stand alone; it is but part of a general intoxication, and the circulatory phenomena are as much due to the action of toxins upon the medullary centres as to the poisoning of the heart muscle. With such a condition drugs such as digitalis must be useless, and it is very doubtful if strychnine, camphor, caffeine have any action whatever upon the heart. An exception may possibly be made with pituitrin 1 c.c. injected deeply into muscles for vasomotor failure, but little can be expected from that in severe heart failure. Digitalis is used by many from the first in large doses with the object of retarding the pulse, but the heart does not fail because of its rapidity but because of its intoxication. Digitalis can only slow this rate by poisoning the heart and blocking too frequent auricular impulses.

The heart can be best helped by giving it food and oxygen. The best food for the heart is sugar, and this can be given from the first as cane sugar, milk sugar, or honey along with the other foods. Intravenous injections of 10 per cent. glucose are perhaps the most valuable of all remedies when circulatory failure has commenced. Oxygen is not in general favour because it is so badly administered. One still sees it given, in large hospitals as well as in private practice, by the futile method of holding a funnel some inches away from the patient's face. When administered through a Haldane's apparatus or through a rubber catheter passed into the nasopharynx it is of decided value in lobar pneumonia, where the majority of alveoli and bronchioles are patent. It is useless in the severe influenzal cases with œdematous lungs and blocked bronchioles, but can then be given subcutaneously.

Alcohol is the most used of all drugs in pneumonia and influenza, and has the sanction of some distinguished authorities. There is no scientific reason for its use, which is mainly based on tradition and the popular idea that it is a stimulant. Apart from its very fleeting stimulating effect, produced reflexly by the irritation of mucous membranes, we know that its chief actions are to depress the nervous system and to inhibit antibody formation, neither of which is desirable in diseases whose toxins are also nerve depressants. The clinical experience cited in its favour is met with equally distinguished evidence against it.

It must be acknowledged that the high mortality of pneumonia and broncho-pneumonia will never be reduced by attempts to treat poisoned organs incapable of response, but by early diagnosis and prompt measures to prevent intoxication by immediate specific treatment and common-sense nursing. Expectant treatment in the early stages is often followed by harmful drugging in the later. Although we have much to learn about the natural processes of defence against the organisms responsible for these diseases, we are not making full use of the knowledge already attained. We have now at our hands weapons by whose use the mortality of pneumonia and influenzal broncho-pneumonia could be reduced to one-quarter of its present height.

A Post-Graduate Lecture

ON

MALNUTRITION, OR THE INFANTILE DYSTROPHIES.

Delivered at the Manchester Babies' Hospital

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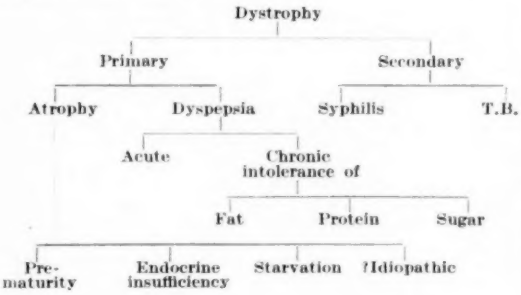
In this paper I propose to use the term "malnutrition" in the widest sense as including all defects of nutrition in infancy, and to use, as illustrations of my remarks, the experience gained from the first 1000 cases treated at this hospital for the treatment of infants under 12 months of age suffering from the defects of metabolism, or, as it is more generally known, from malnutrition.

A child thrives when it takes sufficient nourishment into its body and has a digestive apparatus sufficiently active to digest the food together with tissue cells able to assimilate it. Such a child has an elastic, pink skin, rounded limbs, firm tissues, vigorous muscles, and is of good colour. Its temperature is uniform, its temper happy, its sleep peaceful, its bowels regular, its tolerance of food good, and its gain in weight regular. The infant with stationery weight or retrogressive changes either suffers from a defect originating in its own metabolic powers (i.e., in its digestive apparatus, or its powers of tissue building), or is the subject of some infection whose lesions interfere directly with the intestinal functions, or whose toxins affect growth, or —more rarely—it suffers from some malignant growth.

CLASSIFICATION OF DYSTROPHIES.

The following table shows how infants suffering from malnutrition may be classified.



CAUSES OF DYSTROPHIES.

The detailed causation of 1000 cases discharged from hospital was as follows:—

			Percentage mortality of cases.
Primary nutritional defects—i.e., not proved to be secondary to a systemic disease (892)—			
Chronic dyspepsia	409	.....	19·07
Acute dyspepsia	130	.....	41·5
Atrophy	297	.....	18·8
Premature children—i.e., admitted for prematurity in early months	43	.....	72
Early rickets	13	.....	—
Secondary (108)—			
To tuberculosis	40	.....	25
To congenital syphilis	23	.....	47·8
Unclassified, bronchitis, pneumonia, &c.	45	.....	15·7
	1000		

It must be noted that no child was put down to tuberculosis except on definite evidence of the disease; the same may be said of syphilis. Further, the admittance of cases of syphilis has generally, and particularly in the earlier years, been discouraged. Any constitutional disease, congenital or acquired, such as syphilis or tuberculosis, may cause failure to thrive either by affecting the digestive system, directly causing loss of appetite, defective digestion, and absorption, or by causing undue strain on the system from fever, thus causing excessive katabolism. Such cases are detected by the specific lesions of the systemic disease and diagnosis can be aided, if necessary, by the Wassermann reaction either in mother or child in the case of syphilis or the von Pirquet reaction in the case of tubercle—the latter reaction being of value in the infant under 12 months. Other parenteral causes of wasting are broncho-pneumonia, influenza, pertussis. Apart from the primary cause of the trouble, the secondary effects are the same as in cases of primary atrophy or dyspepsia.

THE ATROPHIES.

Of primary divisions of malnutrition it is more convenient to deal first with the atrophies.[1] These are due to defective power to build up the frame, either because of innate debility or food insufficiency in quantity or quality, rather than to any primary difficulty of digestion or defect of digestive organs or secretions and may be divided into four classes.

1. Those due to prematurity, where the power of the child to take in sufficient food for its own nourishment is at fault. In such cases the infants will often linger for two or three months at 4 or 5 lb. in weight, only able to take sufficient food to keep themselves alive. If their natural food fails them so much energy is demanded to digest artificial feeds that they are totally unable to cope with the situation. In such cases a slight exposure, an incautious addition to the food is enough to upset the delicate balance—death often occurs in these cases with little or no sign of dyspeptic difficulty.

CASE 1.—For example, a female infant admitted at the age of 6 weeks, premature at eight months, weight 3 lb. 10 oz. The child was fed first on cow's milk and water, then on goat's milk and water. At first she took feeds well, her face lost its pinched look, the fontanelle became less depressed, the body temperature was well maintained. On the eighth day there were some curds in stools: from then no gain in weight. No other sign of dyspepsia but her stock of vitality seemed exhausted and she simply faded away.

Such children require breast milk (if necessary diluted), individual nursing, and constant temperature in the nursery if there is to be any hope of saving them.

2. Those cases where there appears to be some defect of metabolism very difficult to discover. No doubt many of them are due to deficiency of some of the glands of internal secretion. I have had some cases showing remarkable improvement on administration of thyroid, but several others were disappointing failures. Hormotone, a pluriglandular extract, has also appeared of value where thyroid alone has failed.

CASE 2.—Male, aged 6 weeks, admitted with acute dyspepsia weighed 10 lb. 4 oz., on recovery from acute attack became of stationary atrophic type. Real progress dated three days after thyroid given—gained weight ½lb. per week.

CASE 3.—In hospital three and a half months before progressed. Improved with mothering—real progress with thyroid ¼ gr. each day, from then gained 4 to 6 oz. weekly and never had relapse.

CASE 4.—Female, mongol, aged 15 weeks. Weight 10 lb. 1 oz. On discharge 13 lb. 3 oz., rise of weight coincident with administration of hormotone.

CASE 5.—Female, admitted aged 15 weeks. For 17 weeks no gain of weight despite careful feeding. Then on lactified milk in four weeks gained 1½ lb. but a greater improvement in general condition and mentality occurred with the administration of hormotone, though thyroid previously had had no effect.

Actual evidence of pathological condition in these glands may be found on post-mortem examination. A ? congenital syphilitic was found on examination to have the greater part of the thymus replaced with fibrous tissues and also an excessive amount of fibrous tissue in the pancreas.

[1] We take atrophy to mean failure to grow and develop, not simply the "athrepsie" of the French or the very wasted child often described under this term.

CASE 6.—A child who had shown no signs of dyspepsia, typically atrophic, after an increase of food developed a temperature of 101° F., frequent stools and sudden collapse. This, incidentally, shows the sudden change to Finkelstein's "decomposition" without intervening stages of dyspepsia in a child with disturbed metabolic balance. The presence of a large thymus extending almost to the diaphragm pointed to some endocrine abnormality. The Malpighian bodies in the spleen were also large in this case and the Peyer's patches hypertrophied.

3. Those due to defective amount of food, quantitative or qualitative, taken by the child—i.e., starvation atrophy. Such cases we see when there are defects of formation such as cleft-palate, facial paralysis, breast-feeding with dyspnœa, slight deficiency in quantity or quality of breast supply, loss of interest in life due to insufficient notice and attention, high dilution of food, as in many Nestlé's milk feeds, as well as cases of vitamin deficiency. Treatment lies in warmth, gradual feeding improvement in quantity and quality, and in the proper proportion of the necessary constituents of diet. The constituents most usually omitted are fat and protein. We are all interested in the "Nem" system of feeding practised by Pirquet in Austria, where the caloric value of the food is the only point he regards, making this up with carbohydrate, entirely neglecting fat either as a necessary constituent of food itself or as the container of fat-soluble A (which Drummond and Coward[2] have shown can be isolated from the fat itself).

Where, however, in the experience of others, a diet largely of carbohydrate is given, disorders described by Czerny and Keller under the name "Mehlnahrschaden" occur; C. E. Bloch,[3] of Copenhagen, has described how different sugars and starches are equally injurious when given alone and for a long time but each has its own special features of disaster. He shows the new-born child quickly collapsing by rapid loss of weight under this treatment of a fat-poor, protein-poor, carbohydrate-rich diet. If an older stronger child is fed with carbohydrate lacking fat and protein, he showed that we get the spongy œdematous child whose tissues contain a large amount of fluid owing to the power of the sugar to retain fluid. Its muscles are weak and flabby due to hypertonicity from œdema. The child looks limp and pale, cracks appear behind the ears. Latent tetany is often present. Stools for long may be normal and then become yellow and loose or brown. Such children do not tend to come to us at the Babies' Hospital till they have relapsed from this stage to a decomposition dyspepsia to be described later. Their mothers are proud of them as large babies, and it is only through a welfare centre we should get them. Bloch describes such carbohydrate-fed children as looking like kidney cases, but as having no ascites, no albumin, and no true kidney trouble. Sometimes these infants get sclerotic infiltration of the subcutaneous tissues. The term "dystrophia amylogenetica" was applied to such cases by him.

4. Idiopathic cases of unknown origin either failing to respond or responding only to general hygienic measures. Heliotherapy, exercise, special mothering, massage, and electricity have sometimes succeeded where previously a lengthened treatment on a suitable diet which has not been changed has been unavailing. Some interesting recoveries have taken place after a serious set-back, as in the following case:—

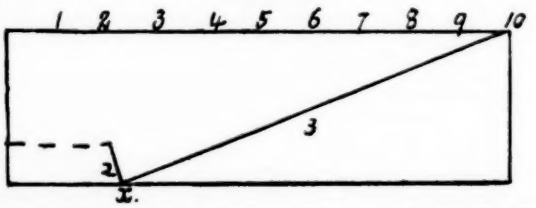
CASE 7.—Male aged 5 months; fourth child. Diagnosed atrophy. The father a soldier; both parents and rest of family healthy.

Infant's Previous History.—There was no history of dyspepsia. The previous diet had been: breast two weeks, then dried milk, then diluted fresh milk. Each of these apparently "suited," but the infant failed to thrive.

Treatment.—Diet: (1) milk 2, water 1, 5 oz., three-hourly; (2) citrated milk, later plus meat juice; (3) Benger's food, with milk and water; (4) milk, first diluted, then pure, without Benger's food.

Remarks.—Although there was no history of dyspepsia, the infant presented the appearance of a case of chronic gastro-intestinal catarrh, being a thin and emaciated baby, its abdomen distended by flatulence and showing dilated venules. For the first two weeks in hospital, on diets (1) and (2) the weight was fairly stationary (see Chart 1). Then,

CHART 1.



The figures above the top line represent weeks after admission to hospital. The chart shows the stationary period on admission and two weeks afterwards; the dip (2) is the acute attack ending at *x*, the turning-point, after which progress begins, its course (3) being mentioned without interruption.

for no obvious reason, the infant suddenly became acutely ill. The stools, hitherto perfectly normal, became green, watery, and frequent, while rapid loss of weight and collapse occurred. Brandy ℥ v. was given four-hourly and the digestive organs were rested by changing the food to diet (3). Within a week all the symptoms disappeared and the child began to gain. From this time on up to his discharge seven and a half weeks later, progress was rapid and steady. He left hospital a bright, muscular baby, 2 lb. heavier than on admission.

This case illustrates how in an atrophic infant the long stationary period may be definitely *brought to an end* by the supervention of an acute attack, which apparently acts as a stimulus calling forth the latent fighting powers of the child. The course of these cases may be illustrated from the one under consideration, thus: (1) Stationary period on admission and for two weeks after; (2) acute attack ending at *x*, the turning point; (3) progress begins and is maintained without interruption.

TREATMENT OF ATROPHIC CASES.

Some of these cases of atrophy are exceedingly difficult to treat. Cases of starvation atrophy often respond to careful intelligent dieting, if intervention has not been too long delayed; but if a child will not take sufficient nourishment to keep him alive it is impossible to help him. Very debilitated infants who refuse food may be helped on by the routine injection of subcutaneous salines or injections of glucose six-hourly for several days. They are then able to digest more food than they previously would take. Some infants who are apparently adverse to food will take it readily after the administration of small amounts of Valentine's meat juice between feeds. This apparently makes them thirsty. The salt aids retention of fluid in the body cells and the stimulation of the extract also has a good tonic effect. Occasionally, Bovril added to a food appears to promote a better assimilation. Fondling has again and again produced valuable results. Sometimes a vitamin-rich food helps. Where infants have been fed on large amounts of sugar this must never be suddenly withdrawn. The substitution of milk dilutions to begin with must be very carefully made, as atrophic children are very apt to become chronic dyspeptics; they are even more apt to miss the stage of dyspepsia to be described later and to contract a sudden food intoxication. Where there is no vomiting, the stools are normal, and the child is not gaining weight the problem is often whether to wait or to give more food—a problem the more complicated, as some of these atrophic children need a very large amount of food in order to grow, and must be fed according to their age, and not to their weight and infantile type. Fortunately, once growth really begins food is much better tolerated. Where there has been excessive carbohydrate, protein milk and, in other cases, lactic acid milk often succeed.

The atrophic child I have tried to describe, the child of stationary development, ends either by recovery—i.e., the treatment suggested above provides a stimulus to anabolism—or it dies. Death occurs from

[1] THE LANCET, 1921, ii., 698.
[2] Brit. Med. Jour., 1921, i., 295.

(1) an infection, or (2) a supervening dyspepsia, or (3) a sudden intoxication of the system by products of a one-sided diet, as often happens in the case of an excessive carbohydrate diet. In a series of our fatal cases at this hospital, where 25 per cent. of the cases ended in an infection, 50 per cent. dated their sudden appearance of toxic symptoms to an increased feed, apparently justified by the conditions of the child. Sometimes death results simply and entirely from pure starvation, as in congenital defectives and infants who will not suck.

DYSPEPSIAS.

Lastly, we have to deal with the dyspepsias. Though many atrophies may end in dyspepsias, and though dyspepsias may themselves settle into an atrophic state, there is a marked difference in both origin and routine treatment of primary atrophies and dyspepsias. That they form two separate groups is shown by the chart giving ages on admission to the hospital (Chart 2). It will be observed that though most cases of both types enter hospital in the fourth to fifth month the curve is sharp in the dyspepsias, whereas the atrophies are more in the first month and are then much more gradually distributed over the first year of life. A larger proportion of the atrophies are twins and illegitimate children and a larger number, as will be seen in Chart 3, are the youngest children in large families.

CHART 2.

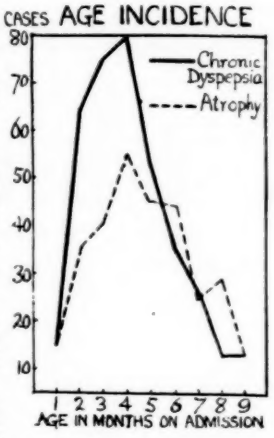
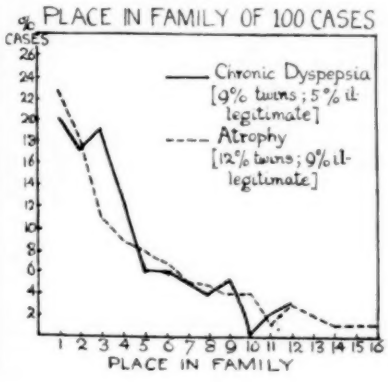


CHART 3.



The dyspepsias are divided into two classes—acute and chronic. With the acute I do not here propose to deal. The chronic dyspepsia may have supervened on an acute attack—due to intestinal infection, to an error in diet either quantitative or qualitative in a normal healthy infant—or be due to a lack of tolerance or digestive inability on the part of the child for some one constituent of the diet—fat, sugar, curds, &c. It is interesting to note how few dyspeptic infants there are on breast milk. Infants are often weaned because the milk "does not agree." They are sometimes cross and may even have unsatisfactory stools on breast milk. I have seldom, if ever, had to wean a child whose mother was anxious to feed it because the milk disagreed. Often the child is starved and therefore cross—the mother is upset by the constant crying of the child or with anxiety about the child. Then the milk produces vomiting; in such cases it becomes more scanty. If the child has supplementary feeds—i.e., has small milk and water addition *after* the breast milk and makes constant demands on her breast first (particularly if the mother's feeding is attended to and she gets her proper rest)—the milk improves, the child is satisfied, and the apparent disagreement of the maternal milk disappears.

DISTURBED FAT BALANCE.

To Czerny is due the observation that previous writers were wrong in ascribing the difficulties of cow's milk digestion to its curd. He pointed out the different symptoms which obtained in excessive starch and sugar feeding and fat feeding. He showed that the whole of the child's system, not just the alimentary canal, was associated in the food disturbance. Finkelstein studied these systemic symptoms even more thoroughly, and from the weight charts finally elaborated his four classes of food disturbance. He considers that two results follow an unsuitable diet—first, that the child's functions are upset, he is not well, and he vomits; second, that the excess of the constituent presented to him actually poisons him. Strong children are able to deal with great variations of constituents, but if congenital debility, previous illness, or careless feeding lowers his energy, toxæmia is sure to follow. He considers pallor, restlessness, constipation, fat-soap stools and stationary weight a first stage in dyspepsia and calls it the period of disturbed balance from (1) high fat, (2) congenital idiosyncrasy to milk, (3) enteral or parenteral lowering of tolerance. In this condition we get paradoxical reactions, of which we have many examples in hospital: if the feed is increased the child loses, if it is lessened he gains. Some of these cases of simple disturbance of balance are difficult to distinguish from atrophy.

TRUE DYSPEPSIA.

The next stage is that of true dyspepsia with sugar indigestion and fat indigestion, and hence with vomiting and stools which are increased in frequency, thin, watery, and of abnormal odour, either offensive or acid.

Decomposition.—In this stage there is great difficulty in getting the child to assimilate any diet. There is extreme loss of weight and tendency to infection. Time after time the tolerance may be with difficulty regained and the weight persuaded to rise, but the slightest excessive effort for improvement produces a catastrophic drop from which recovery is almost impossible. Temperature is often subnormal, pulse slow, respiration rapid. The children are often nervously alert. Stools are frequent, œdema and cyanosis may supervene; both the latter are bad signs, œdema being practically a sign of the end. In these cases starvation is dangerous yet feeding is precarious. Protein milk or skim lactic milk is particularly well tolerated in these cases. Meals should be small and frequent and the child should be kept very warm.

Intoxication.—The latest stage, where collapse and nervous symptoms preponderate. Fever is high, vomiting frequent, stools liquid and frequent, the skin grey and wrinkled, eyes shrunken with a far-away look, nose pinched. The arms are flexed, hands in the mouth or the mouth (often bright pink in colour) wide open. Stupor, coma, and toxic respiration may supervene. Sclerema of the tissues and enlargement of the liver are often found.

TREATMENT.

Where there has been a disturbance of food balance this must be recovered. It is wise to make a fresh start by clearing out the intestinal tract. Hence we give ol. ricini followed by a wash-out if thought necessary. Then a food light in quantity and quality is given. If there is vomiting, one stomach lavage is given and some sod. bicarb. solution left in the stomach. The first feed for any infant of 3 months or under is milk one part, water two parts, with five teaspoonfuls of sugar to the 24 hours, feeds either two and a half or three-hourly and quantity according to the weight of the child. This will not supply the caloric needs of the child, who must therefore be kept warm and watched. The food is increased as rapidly as possible by first increasing the sugar to seven teaspoonfuls if the stools are not frequent. Then an

ounce or even 2 ounces in the case of a fairly big child is added to the *total day's feed*. If alimentary disturbance follows the addition of milk to the 1 in 3 dilution, the food value is increased by substituting barley water for water, thus adding extra carbohydrate absorbed at a different rate to either the lactose in the milk or the cane sugar addition. If there is still difficulty with digestion the food is predigested by Benger's food. A small quantity of this—e.g., a teaspoonful—by the diastatic ferment present may help to predigest a total day's feed. This method of predigestion is often more readily taken than peptonised milk, because of the sweetening effect of carbohydrate present in the Benger's food. Peptonised food, prepared from pancreatic extract alone, unless carefully treated, tends to become unpleasantly bitter and the infants reject it. If a higher caloric value is needed, a larger amount of Benger's may be given to increase the food value, especially if the child is of an age to stand predigested starch. If improvement does not take place on this method or if there is definite fat intolerance, lactified skim milk is then tried. In our lactic acid preparation we at this hospital use the lactic acid milk sweetened both by cane sugar and dextrin maltose (in the form of Mellin's food). The malt is not very suitable to children under 3 months, and in these cases we are trying the lactified milk with glucose, which has been given largely in America.

Some cases of atrophy also appear to do very well on either skim buttermilk or unskimmed diluted lactic acid milk, and, indeed, most children over 3 months tolerate larger proportions of milk if previously lactified than if it is not thus treated. We incubate for 16 hours at 36°–40° C., using P.D. tablets to start the culture. This can be quite easily prepared in an ordinary house, and I would strongly urge practitioners faced with difficult dyspeptic and atrophic infants to try this method. At the end of the time the milk ought to have a pleasantly acid taste but not be curdled. It ought to have about 0·25 to 0·5 per cent. of lactic acid. If the total feeds for 24 hours are being prepared, the milk should be heated to kill the bacteria, but must be carefully stirred during the heating or it will clot. If curds are formed they had best be rubbed through a sieve but this should be unnecessary if care is taken in the boiling. If the action of the lactic bacteria is needed to check the growth of other intestinal micro-organisms the milk must not be heated, but two cultures a day should be made and the feeds prepared twice, or the milk will be too sour at the end of the day. For stools where the lactic acid bacteria are useful to stop the growth of other micro-organisms, however, we use "lacteol," tablets consisting of lactic acid and lactose, dissolved in tepid water as more convenient than lactic acid milk.

In treating fat intolerance, as Morse and Talbot[4] say, "it is never a mistake to cut the fat too low—time is always lost if the reduction is insufficient." On the other hand (p. 261), the continuous use of a food too poor in fat tends to weaken the power of digesting fat. Also the caloric value of fat is high and must be adjusted in the feed as soon as possible; therefore, we proceed as soon as possible from skim lactic milk to half milk and half water and then to milk 3, water 1 lactified, if the child is over 3 months of age.

In treating *carbohydrate* intolerance it is important to remember that though all forms of carbohydrates have common symptoms, each has its own difficulties, and a substitution of one for another or a combination of several may relieve the strain on the digestive power. Also it is very necessary to remember that total withdrawal of sugar, especially where the sugar feeding has been high, is often followed by collapse. Sugar helps to retain fluid in the body tissues. Raisin tea containing glucose, an easily assimilable form of sugar, is readily taken by the dehydrated child. When tolerance for lactose has once disappeared it is very slowly recovered. Lactose is not usually the best form of sugar for a sick child—it produces loose, watery, acid, and irritating stools. In cases where lactose tolerance is gone, whey mixtures are obviously bad; cereal water with milk, and protein milk are advisable. Where there is difficulty with *protein*, absorption is assisted by peptonising the milk with Benger's or Fairchild's powder or by making it alkaline with sodium citrate, so that the curd is light and flocculent, or by lactifying it so that the fine curd formed by this method, and which is unaffected by the gastric juice, may be carried quickly through a pylorus relaxed by the acidity of the feed.

[4] Diseases of Nutrition, p. 262.

DRUGS AND GENERAL HYGIENIC CONDITIONS.

There is little use for drugs in the dyspepsias of infancy. Alkalies are necessary where decomposition and intoxication—i.e., acidosis—is taking place. Of stimulants, caffeine, camphor oil, and pituitary are useful for rapid action, and alcohol as a stand-by, especially when given either with the food, as in sherry whey, or five minutes before as a stimulant to the gastric mucous membrane. Bromide and tincture of belladonna are both useful in cases of vomiting, where nervous irritability of the stomach is suspected of being at fault.

More important than drugs are general hygienic conditions. As soon as the body can tolerate sufficient food to maintain its own heat, regular opportunity for exercise must be afforded. Till then the stimulation of warm baths (giving more than one each day if needed in collapsed cases), friction, electricity, nursing and mothering all help. Fresh air and sun treatment administered with care assist the recovery of all cases of infantile dystrophy, whether atrophy or dyspepsia. No infants' hospital should be without its garden and sun ward.

SUMMARY OF TREATMENT.

In infant dystrophies take a careful history—study the type of child. If the child appears of the debilitated atrophic type stimulate its appetite and its metabolism by massage, electricity, baths, stimulants, nursing, general hygiene—see that it is warm, gets sufficient well-balanced food increased as rapidly as may be, always watching for signs of intoxication, acidosis, febrile temperatures, and infections. On the other hand, if there is intestinal disturbance, sickness, vomiting, begin with a light diet and increase with great caution. Find from the history of previous diet what has been the offending constituent. Suspect fat and remember that fat tolerance, once lost, is regained with the greatest difficulty, but that sugar tolerance can be regained fairly easily, especially by making use of the various forms of sugars and starches; that protein is well tolerated, especially if the curd is lightly and easily passed through the stomach. Build up slowly with what is tolerated till a properly balanced diet can be resumed. Never rest satisfied till that balance is obtained and the child is on the most easily prepared food having the necessary constituents.

Acknowledgment must be made to the monthly reports of the registrars of the hospital for the notes of cases and for the first chart.

SALFORD ROYAL HOSPITAL AND THE LATE DR. A. M. EDGE.—An anonymous friend of the hospital has sent a cheque for £2000 for the purchase of a certain property. This sum with the money in hand, making a total of £7000, will enable the board of management to provide accommodation for the additional nursing staff required and space for erecting open-air wards for semi-convalescent patients. In addition £587 were received from a musical festival, and £1019 from the Committee of the Hospital Sunday Fund. The deficit on last year's working was £7500. The following resolution regarding the services of the late Dr. Abraham Matthewson Edge, who died at Southport on July 27th, aged 71, was put on record. It stated that Dr. Edge was appointed an honorary physician to the hospital in 1878, and remained on the active staff until his election as an honorary consulting physician in 1913, and that during this long period of 35 years of his active connexion with the hospital he specially devoted himself to the relief of the suffering poor. "Ever kind and courteous, his sound judgment and high personal character were always esteemed by those connected with the hospital."

BLOOD TRANSFUSION:
AN AUTOMATIC METHOD OF CITRATION AT BODY TEMPERATURE.*

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BLOOD transfusion as a method of treatment in certain serious conditions has come to stay. Moreover, I think that the indirect method with citrated blood, at any rate in civil practice, is preferable to the theoretically better method of transfusion with untreated blood. It is hardly necessary to discuss the relative advantages of the two procedures: they are well known to those experienced in these matters. In both methods avoidance not only of clotting, but also of *pre-clotting* changes in the blood is considered to be of vital importance. Numerous deaths, previously unaccountable, which have occurred a few hours after blood transfusion, are now believed by many to have been due to changes in connexion with the process of clotting of the donor's blood. It has, therefore, seemed to me that the methods usually adopted for the citration of human blood have several serious disadvantages. First, it can hardly be denied that the passage of untreated blood through the often rusted lumen of a steel needle and then through many inches, perhaps feet, of rubber tubing, the lining of which is always rough, before the citrate solution is reached, must favour those alterations in the blood that are precursors to clot formation, if not the actual process of clotting. Another disadvantage is that the shaking of the flask containing the citrate solution into which the blood has been received not only imperfectly mixes the two fluids and leads to froth formation, but also cools them to a considerable extent. In the hands of the inexperienced all these disadvantages tend to become accentuated.

Description of Apparatus.

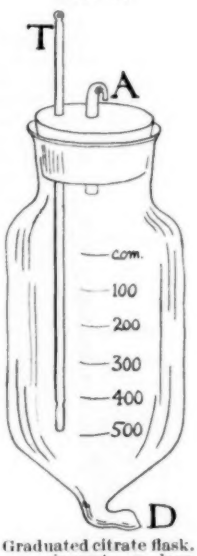
In order to simplify the most important and difficult part of the citrated blood method, I have had made and have used a special needle cannula (Fig. 1). This consists of a tapering glass tube into the pointed end of which is fused a hollow iridium-platinum needle, the diameter of the lumen being of fixed size; and, at an angle of 45° facing the direction of the current of escaping blood, there is another glass tube with a smaller bore opening into the lumen of the glass cannula, with which it is fused. At first we attempted to base the diameters of the two lumina on mathematical formulæ, whereby we sought to obtain the delivery of one part of citrate solution in four parts of blood passing through the cannula, when both fluids were at equal pressure. Other factors, however, such as the differences in viscosity between the two fluids, and the effects of the retardation of the flow of the citrate solution by the blood current and of syphonage, all complicated the matter. Later, after many experiments, we found that if the lumen through which the citrate solution is delivered be 0·625 mm. in diameter, while that of the lumen of the cannula needle be 2·0 mm. then, whatever the venous blood pressure may be, the proportion of citrate solution entering the cannula can so be regulated by means of a by-pass as to approximate one part to five parts of blood.

FIG. 1.

Needle cannula for collecting and citrating the donor's blood. An iridium-platinum needle is fused into tapering glass tube, the latter having a glass tube of smaller bore entering it at an angle of 45°.

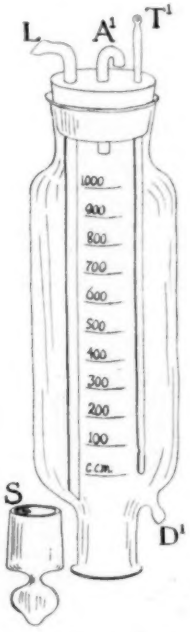
It was also observed experimentally that when clear, coloured solutions were used for the purpose, the mixing of the two produces a trailing shower of the fluid representing citrate solution throughout that representing blood; in other words, perfect mixing occurs. Consequently, we have found it necessary neither to use such a large proportion of citrate solution as that generally employed (one part with three parts of blood), nor to employ so strong a solution as 3·8 per cent. It is enough to use one part to four parts of blood of a solution containing 2·5 per cent. sodium citrate made isotonic with 0·29 per cent. of sodium chloride. This question of the strength of the citrate solution is, however, a small point, and possibly it will be found simpler to use isotonic sodium citrate solution, especially as less is required in this method than in the other procedures for the citration of blood.

FIG. 2.



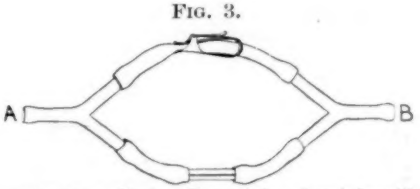
Graduated citrate flask. A, air-vent; T, long high-recording thermometer; D, delivery nozzle.

FIG. 4.



Receiving flask. T¹, thermometer; A¹, air-vent; L, long tube; S, hollow glass stopper; D¹, delivery nozzle.

FIG. 3.



Showing by-pass on citrate delivery tube: free tube with clamp above, by-pass below. A, to cannula; B, from citrate flask.

A graduated flask (Fig. 2) contains the citrate solution. There is an air-vent (A) and a long, high-recording thermometer (T) passing through the rubber stopper, and a delivery nozzle (D) at the bottom, to which a tube is attached leading through the by-pass arrangement to the small-bore tube on the cannula. This by-pass on the citrate delivery tube is a simple contrivance (Fig. 3), consisting of two Y-shaped glass tubes connecting the by-pass arrangement with the two parts of the citrate delivery tube, three short

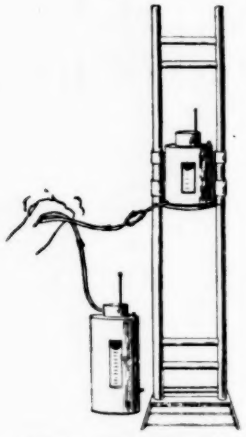
* A demonstration of this apparatus and method was given at the Liverpool Medical Institution on March 31st, 1921 (THE LANCET, 1921, i., 752).

pieces of large-bore pressure tubing, one of which—called the free tube—is twice the length of the others, and a piece of glass tubing two inches in length and having a bore of 0·625 mm. The rate of flow is reduced by compression of the free tube with a clamp. When this has been closed the citrate solution escapes only through the narrow-bore glass by-pass, and the rate of flow into the cannula is thereby considerably decreased.

The receiving flask (Fig. 4) is also graduated, and passing through the rubber stopper are a thermometer (T[1])—similar to that just described,—an air-vent (A[1]), and a long tube (L) reaching nearly to the bottom of the flask, through which the citrated blood pours into the receptacle. At the bottom of this flask is a hollow glass stopper (S) which is provided as a measure of safety in case, by any chance, a clot should form. If this should happen the clot would collect in the stopper and subsequently easily be removed. The delivery nozzle (D[1]), it will be observed, is well above the level of the hollow stopper, and to it is attached a tube with cannula for transfusion into the patient.

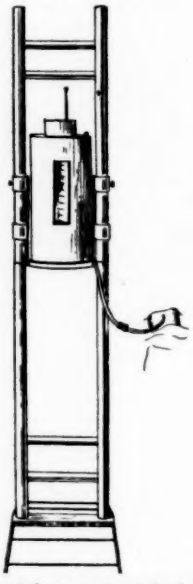
Each flask has its own heat-preserving container (Figs. 5 and 6). These containers are hot-water tanks with central spaces for the flasks and are covered with felt. There is a glass window in the side of each through which the graduation marks on the flasks can be observed. Small 4-volt lamps, fixed inside the windows when connected with an ordinary dry battery facilitate observations of the fluid levels. The containers are both filled with hot water at a temperature of 110° F. The loss of heat is very slow—about 3° F. in one hour. I have also had made a light stand of bicycle tubing (Figs. 5 and 6) which has stem-and-tube joints, in order that it may be taken to pieces. The citrate flask and its container are placed in the movable cage on the stand while the blood is being withdrawn from the donor (Fig. 5). The flask containing the citrated blood and its container are subsequently placed on the stand at a desired height for the purpose of transfusion into the patient (Fig. 6).

FIG. 5.



Citrate container raised on stand during collection of donor's blood, with receiving flask on floor.

FIG. 6.



Container on stand during transfusion of citrated blood into the patient.

Method of Transfusion.

The operation of blood transfusion with this apparatus[1] is carried out as follows: The upper arm of the donor—right or left, as the case may be—is compressed by means of a pneumatic tourniquet. With all aseptic precautions the chosen vein in the forearm is exposed by means of a small incision through the skin over it and a single loop of catgut is passed round it. The flask and container with the citrate solution are raised on the stand to a height of about 1 foot above the vein of the donor. The receiving flask is placed on the floor at the foot of the stand (Fig. 5). There are three clamps on the different tubes which are closed at first—one on the main citrate delivery tube below the by-pass, one on the free tube of the by-pass, and one on the tube to the collecting flask. First, these clamps are all opened while the cannula is held at a suitable height to allow 50·0 c.cm. to flow from the citrate solution flask into the receiving flask without escaping from the cannula needle. All the clamps are then closed and the receiving flask and its container are tilted until some of the citrate collected in the hollow stopper runs into the delivery tube at the bottom of the flask. This tube—clamped for the time being—and the ordinary cannula attached to it have been sterilised with the flask, and are contained in a batiste bag in the bottom of the container till required for the performance of transfusion into the patient. The receiving flask and its container are now left upright on the floor, and after the clamp which has hitherto remained open on the free tube of the by-pass apparatus has been closed, the clamp on the main delivery tube from the citrate flask is opened. As a result the citrate solution flows through the by-pass and escapes drop by drop from the cannula needle as soon as this is lowered below the level of the citrate solution. The loop of catgut on the donor's vein is pulled taut, and while the citrate solution is dropping from the point, the needle is plunged into the vein of the donor. At the same moment the clamp leading to the receiving flask is opened.

The citrated blood rapidly collects in the flask. The rate of filling is watched and compared with the rate at which the level of the citrate solution is falling. If it should be found that not sufficient citrate is passing through—that is, less than one in six parts of the mixture—the clamp on the free tube of the by-pass apparatus may be opened. As a rule, however, once the flow of blood has started the rest is quite automatic and no interference is needed. The receiving flask may be filled with citrated blood up to the zero mark when it will contain 1250·0 c.cm. As all the tubes and the hollow stopper at the end of the receiving flask are first flushed with a quantity of citrate solution amounting to about 50·0 c.cm., the final mixture, if the total quantity of citrated blood be 1250·0 c.cm., contains 250·0 c.cm. of citrate solution to 1000·0 c.cm. of blood.

As soon as sufficient blood has thus been obtained the tourniquet is released, the needle is withdrawn from the vein of the donor, and sutures are placed in the small skin incision. A tight bandage is applied over a gauze dressing in order to prevent any leakage from the puncture hole in the vein. There is now no need for hurry; the citrated blood is kept at the proper temperature in the flask within the container. These, with the stand, are taken to the bedside of the patient. The container is then placed on the stand at a suitable height—about 18 inches above the recipient's arm. A vein is exposed and the cannula attached to a tube connected with the delivery nozzle of the receiving flask—now converted into a transmitting flask—which has been kept ready for use in a sterile bag, is flushed with the citrated blood and then tied in the vein of the patient in the usual way. Transfusion is thus effected.

When properly performed the operation, somewhat difficult to describe, has proved very simple in the numerous cases where it has been employed. There is no need for hurry or anxiety as to temperature, possibility of clotting, or wasting of blood. It is a clean, straightforward procedure, and throughout the performance of it neither the donor nor the recipient sees a drop of blood. Above all, it is safe.

[1] The apparatus in part (cannula), or complete, can be obtained from Messrs. Alexander and Fowler, Pembroke-place, Liverpool.

OLD AGE AND BLOOD-PRESSURE PROBLEMS.

BY R. J. C. THOMPSON, M.D. DURH., M.R.C.P. LOND.,
AND
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FROM the time that we began our closely collaborated work at the Royal Hospital, Chelsea, we have made frequent use of the Tykos blood-pressure apparatus—at first regarding it as a valuable means of estimating departures from the "normal," latterly finding it a most interesting support of our gradually dawning heresy that in dealing with old age there is no "normal." Taught that blood pressure in the human being pursues an inevitable course, reaching a standard level about early manhood and gradually rising with advancing years, we attempted to correlate our findings with accepted teaching. We were soon puzzled by the paradoxical readings in men of over 75 whose radial arteries were nodular "pipe-stems," one case exhibiting a pressure of 195/100, another, apparently parallel, 140/75, a third 115/70. We then took systematic readings of 102 in-pensioners all from 75 to 92 years of age. The resulting figures are expressed in the graph which forms the basis of this paper. We do not attempt to lay down any law: we offer our figures, believing them to be accurate as far as instrumental accuracy may be relied on, to the many who are interested in blood-pressure readings.

We add a few remarks which have materialised from our heated discussions over points which have puzzled us, and, confession being good for the soul, puzzle us still after groping in the literature for a solution.

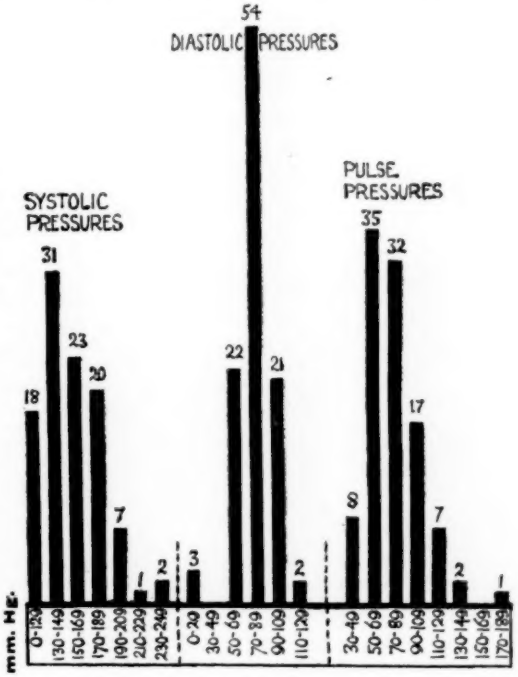
Principal Factors of Blood Pressure.

The principal factors concerned in blood pressure are presumably: (1) the heart—the pump; (2) the arterial system—the pipes; (3) the capillary bed—the field of irrigation; (4) the quality of the blood—the irrigating fluid; (5) the quantity of blood available; and (6) the mechanisms regulating the calibre of the pipes and the rate of blood-flow, nervous, chemical, toxic, mechanical.

Up to and including middle-age the heart, the pump, in the absence of obvious endo- and myocardial disease, may be accepted as a constant factor; as may the arteries, the pipes, in the absence of obvious sclerotic change. Under such circumstances it has been possible to formulate—by compression of the left brachial artery—a standard, an average taken from many thousands of cases, in fact a "normal" of pressures taken at this site of election. In the physiological laboratory it is impossible to model a pump comparable with the living human heart, still more impossible to devise any contrivance to represent a degenerated heart, the action of which cannot be guaranteed from hour to hour, even from beat to beat.

The primary factor in the blood-pressure phenomenon is the heart, and we submit that it is impossible to formulate a blood-pressure "normal" for a period of life during which the heart is an inconstant factor. General, or localised, arterial disease again precludes the possibility of supposing a standard applicable to old people. We do not suggest that every man over 80 years of age has a degenerated heart or established disease of the arteries, but it may be presumed that after so many years of constant use they are the worse for wear. From our post-mortem observations at Chelsea we have reason to believe that the large majority of old people have deteriorated cardio-vascular systems. The quality and quantity of the blood are factors which we have not investigated.

The nervous, chemical, toxic, and mechanical factors regulating and modifying the calibre of the pipes, and the rate of flow of the blood, are subjects of which we *know* nothing. The graph shows that the majority of our 102 cases exhibit a mode of 130–169 mm. systolic pressure, with a majority of 8 cases at the lower level of 130–149. An undoubted preponderance, 54 out of 102 cases, with diastolic pressure from 70–89 mm. Hg occurs. Pulse pressures appear to vary mainly between 50–89 mm. Hg. But to apply these figures as a "normal" for this period of life is obviously impossible when one is faced with active



Graph, showing blood pressures taken from 102 men, from 75 to over 90 years of age, at the Royal Hospital, Chelsea.

die-hards with signs of neither hyper- nor hypotension and no apparent answer to the puzzle that their blood-pressure readings vary from 190/100 to 95/45.

Abnormal Blood Pressure as a Morbid Symptom.

Rapid variations—e.g., the fall with hæmorrhage, the rise with perforation, are valuable diagnostic signs in enteric fever. Gross, more or less constant, variations from the "normal" are commonly associated with the "red granular" kidney and Addison's disease, but it is not perhaps sufficiently recognised that abnormal blood pressure may be only one of several symptoms and often the least important. It is sometimes a useful indicator in estimating the progress of the particular disease and the results of treatment. Categorically to deny, as some do, that blood pressure having attained a certain level can change to a lower level, compatible with the well-being of the individual, is to discredit the extraordinary adaptation of which the system is known to be capable, and of which further evidence and proof are continually forthcoming as scientific research proceeds.

Our findings have compelled us to become agnostics so far as blood-pressure problems are concerned; there are so many clinical findings for which there is no satisfactory explanation. Take the part played by the kidney, for example. Granted that signs of disease may not be demonstrable until a large proportion of the kidney is out of action, at what stage in the disorganisation of renal tissue does the kidney take a part in the production of hypertension? To what extent do the conditions grouped together as nephritis come into the hyperpiesia picture?

We have referred to the heart and arterial system as being two of the blood-pressure factors which preclude the possibility of establishing a "normal" for old age. The capillary bed, the field of irrigation, is a field of controversy in which even the wisest men tread very gently, and we dare do no more than sit on the fence and throw into the field a few conjectures from our clinical observations. Our notes are founded so obviously on the work and writings of such authorities as Clifford Allbutt, Rose Bradford, Herringham, Dale, Norris, Batty Shaw and others, that in this short paper written round our figures we do not attempt a bibliography.

Further study of primary hyperpiesia may mould facts out of theories. Histamine is a toxic body and a "depressor." In surgical shock normally closed irrigation beds are said to be opened, the volume of circulating fluid reduced, and the blood pressure is lowered in consequence. It may be found that toxic "pressor" substances, either by contracting the general pipe system or by shutting off certain irrigation beds, increase the rate of flow or the volume of fluid to be despatched throughout the system, and so increase, even temporarily, the pressure in those areas remaining open for irrigation.

Red Granular and Arterio-sclerotic Kidney.

It seems to be generally agreed that the "red granular" kidney and the "arterio-sclerotic" kidney are histologically the same as far as the vascular elements are concerned. Lawrence discriminates:—"The red granular kidney is entirely due to occlusive endarteritis of the small arterioles of the kidney, of the afferent vessels of the tuft, and of the capillaries of the tuft. The scarred kidney—i.e., the arterio-sclerotic kidney—is due to occlusive endarteritis of the larger interlobular arteries, or arteriæ arciformes."

Though we see many arterio-sclerotic kidneys from the period of life under review in this paper, we do not see the syndrome associated with the red granular kidney. In our experience, a man who has reached the "old age stratum" seems to have passed the era of angina pectoris, the red granular kidney, and the higher grades of hypertension. Out of five fatal cases of cerebral hæmorrhage in our series three were in men of over 75 and two were men of 65. Pipe-obstruction seems more common than pipe-breaking in the furred-up and more rigid pipes of the damaged machines we have dealt with. It seems a reasonable suggestion that the more early fatal red granular kidney may be a condition, toxic in character, primarily renal in origin, which works back along the arterial system to the heart; while the arterio-sclerotic kidney, as a distinct condition, may result from primary hypertension operating centrifugally from the heart. We have seen in younger men the red granular kidney with obvious left ventricular hypertrophy and the text-book post-mortem findings. We have seen many arterio-sclerotic kidneys with hearts very little, if at all, hypertrophied, and in many cases with the myocardium, particularly of the right ventricle, definitely degenerated and atrophied.

Our blood-pressure figures from a number of men who may be presumed to have arterio-sclerotic kidneys—or Councilman's "chronic atrophic nephropathy"—do not point to resistance in the renal capillary bed as being an unimpeachable factor in the production of hypertension. The outstanding fact is the similarity in the histological picture of the "red granular" and the "arterio-sclerotic" kidney as far as the vascular elements are concerned. It is certain that, wherever the starting point, whatever the cause, whatever the specific difference in effect between these differently named but similar conditions, an adaptation compatible with extended life can be arrived at between the weakened but willing heart and the damped-down furnace of old-age metabolism.

Variations of Readings.

We have found the old men very tractable in tolerating our blood-pressure examinations. For the most part they hold the arm to be examined well relaxed and in an unstrained position. Even their original idea that the Tykos and a stethoscope meant some form of vaccination did not unduly agitate them. We have noticed that little spurts of temper, disagreements as to which man was next for examination, &c., caused readings higher than usual for that individual. The readings from these very old men undoubtedly fluctuate to a disconcerting extent from causes which might easily escape the consideration of an observer not accustomed to senescents en masse. Perhaps the most interesting variations have been observed in a series of 46 men, aged 76 to 92 years, whose readings were taken, for no particular reason, between 5 and 7 p.m. on Sunday and Monday, May 21st and 22nd, 1922, on which days the shade temperature suddenly reached 84° to 86° F. We compared these readings with previous figures of the same men and found that this sudden introduction of summer had, we suppose, either by depressing the heart's action, or by dilating the pipes and irrigation field, or both, caused a remarkable fall of pressure in 72 per cent. of the cases. These new figures were graphed in order of age against the previous readings, and still further convince us that there can be no dogmatic "normal."

Certain cases gave particularly interesting readings. A man, aged 78, whom from several previous observations we had recorded as 200/100 showed 165/75 on the Sunday evening. Another man, aged 89, showed 182/72 as compared with our previous record of 200/95. Thirty-three out of 46 cases showed a fall in pressure, both systolic and diastolic, of at least 10 mm. Hg. The figures of three men corresponded with previous readings. In ten cases the systolic pressure was higher by 5 to 20 mm. Hg, with a slight correspondence in rise of the diastolic pressure. These differences in pressure seem to indicate the necessity, when making a "normal" standard for any series of ages, of ensuring that the readings are made under parallel conditions, climatic and otherwise.

Possible Prognostic Value of Pulse Pressure.

There is a class of case in which we suggest that further observation may perhaps show the pulse pressure to be a valuable prognostic sign. A man, aged 82, clinically myocardial degeneration, was admitted to the infirmary with the failing heart syndrome, œdema of legs, dyspnœa, &c. Pulse pressure 25 to 30 mm. until he began, presumably, to rebuild his myocardial reserve. He returned to his bunk in the main building with pulse pressure 65 mm., able and glad to do his own light jobs for himself. A similar case, aged 83, showed a pulse pressure of 35 to 40 mm. while still very ill, but this figure became 65 as he recovered and had turned the corner. The diastolic pressure remained fairly constant, the load remained the same, but the systolic pressure rose with the increase in force of beat. We infer that the pulse pressure may be an indicator as to whether the myocardium is or is not taking unto itself a new lease of reserve power and can combat, reasonably for the individual, that important factor the "diastolic load."

Small Practical Value of Readings.

The net result of our clinical blood-pressure observations on very old people is that the readings are more of theoretical interest than useful in diagnosis or treatment. A man of over 80 with no subjective or objective signs whose mechanism has become adapted to a 200/100 pressure is *not* a case of hypertension to be dosed with iodides and nitrites, to be carefully dieted and subjected to balneo-therapy. His medical attendant may be thankful that the man has been fitted with what is probably a compensatory and beneficent high systolic pressure. He will be wise in not tampering with the individual in order to treat a diagnosis.

We submit that his, or her, high or low blood pressure is not a subject to be discussed with the patient either directly or by suggestion. There are already too many people who quote their blood-

pressure figures. It is enough that such people regard their "nerves" and intimacies of metabolism as topics of general conversational interest. Freedom from anxiety, business, domestic and personal, is therapeutically most important for the subject of the hypertension which requires treatment. Patients who brood over their own blood-pressure figures, or the fact that their doctor has told them that they "suffer from high blood pressure," are very prone to become the subjects of a vicious circle in which the processes revolve the faster the more introspective the patient becomes.

We wish particularly to thank Sir Humphry Rolleston for his very kind and constant encouragement in our work at Chelsea, and for the invaluable advice he has given us in the preparation of our papers for publication.

A NOTE ON HETEROPHYES NOCENS

AS A DISTINCT SPECIES OF TREMATODE PARASITE.

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IN the *Journal of Parasitology* for December, 1921, Cort and Yokogawa drew attention to *Heterophyes nocens*, Onji and Nishio, 1915, inhabiting the middle third of the small intestine of man, and whose ova were found in the stools of 31 out of 168 persons dwelling in two villages in the Yakaguchi Province of Japan. Its distinction from the Egyptian *Heterophyes heterophyes* was based upon the differences, mainly in measurements, found in the first two columns of the accompanying table. The original table was accompanied by the comment, "An examination of the table shows that these two species are distinct."

Table of Measurements of Heterophyes.

	As cited by Cort and Yokogawa.		As observed by Lane.
	H. heterophyes.	*H. nocens.*	*H. heterophyes.*
Length	1–1·7	0·9–1·1	1·05–2·7
Width	0·3–0·6	0·4–0·52	0·5–0·7
Spines	With serrated posterior margins.	Without serrated posterior margins.	
Oral sucker, diameter	0·09	0·08	0·09–0·11
Acetabulum, ,,	0·23	0·2–0·22	0·22–0·37
"Genital sucker," diameter	0·15	0·1–0·13	0·17–0·27
Rodlets on genital sucker, number ..	70 to 80	About 60	61–74
Ova	30 × 17	28 × 15·5	22–26 × 14–16

All the measurements are in millimetres, except for the ova, where micro-millimetres are implied.

In criticism it may be noted that the measurements are those of muscular organs, or of the body as a whole which is itself to a considerable extent a muscular structure, and that the degree of muscular contraction must and does materially alter the shape and size of both; that apart from this the upper and lower limits of the measurements in several cases overlap; that in trematodes the spines may vary in shape and size in different parts of the body, as Ward and Hirsch have convincingly shown for *Paragonimus westermanii*, the lung fluke of man; and that as regards the intestinal cæca the illustrations of Cort and Yokogawa indicate that in artificial infections, which it is claimed to have been effected, the intestinal cæca in flukes two days after infection are equal in length. On these grounds I have placed *Heterophyes nocens* as a synonym of *Heterophyes heterophyes*, in Vol. III. of Byam and Archibald's "Practice of Medicine in the Tropics," now in the press.

The next step taken in the matter was that of Leiper in a brief helminthological review in the *Tropical Diseases Bulletin* for June, 1922. Commenting on the new species he notes, "A re-examination of material from the Chinese and Japanese cases, with specimens collected in Egypt, does not reveal any constant specific differences." This does not seem to advance matters, since there might presumably be two species of *Heterophyes* parasitising man in Japan, the presence of one only of which, in the laboratories of the London School of Tropical Medicine, has no obvious bearing on the matter.

Since these happenings I have been fortunate enough to obtain material passed by a Japanese after the exhibition of 60 gr. of thymol. These flukes varied greatly in length, particularly in the degree to which the mobile pre-acetabular portion of the body was extended. The essentials of their description are contained in the third column of the accompanying table. It has been mentioned above that the supposed specific differences in the case under consideration rest mainly upon measurements affected by muscular action. These could only conceivably be the basis of accurate comparison, could one be satisfied that in either case the muscles concerned were contracted to the same degree. Obviously this is impossible. The last column illustrates the fact, well known but little appreciated, that the state of relaxation is extraordinarily variable, and that the limits of size, maximum and minimum, are altered accordingly, and to so considerable an extent, that to rely upon them as constituting specific differences seems perhaps as reasonable as it would be to classify sparrows specifically according to the extent to which their wings remain spread in rigor mortis.

The number of rodlets on the genital sucker is clearly variable, and if measurements suggest anything, it is that they may increase in number with growth. In any case one has constantly to decide whether one will consider a branched rodlet as two or one. Since the symmetry or otherwise of the intestinal cæcal terminations varies with the age of the fluke, if the illustrations of Cort and Yokogawa are to be accepted, they quite possibly vary in the adult under the influence of other factors, and can hardly be accepted as being of specific value. There remains the shape of the posterior margin of the very minute cuticular spines on which the writer expresses no opinion other than that were he able to detect it, he would still require proof of its constancy before admitting that it could be of value as influencing at all the question of specific difference.

The new evidence affords no grounds for revision of the judgment that the name *Heterophyes nocens* must lapse as a synonym of *Heterophyes heterophyes*, and human helminthology be correspondingly simplified.

PRIAPISM

COMPLICATING MYELOGENOUS LEUKÆMIA AND NOTED AS THE FIRST SYMPTOM.

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ALTHOUGH priapism is so well-recognised a complication of myelogenous leukæmia that von Leube has laid stress upon its diagnostic value, yet there are few cases of it on record in the literature. Indeed, although the condition is mentioned by the writers on leukæmia in the "Systems of Medicine," compiled by Allbutt and Rolleston and Osler and McCrae, yet neither of them had seen a case. In 1880 Peabody collected 32 cases of persistent priapism not connected with lesions of the central nervous system; and of these only seven were definitely connected with leucocythæmia. To this number, he suggests, one or two of the cases recorded before the Virchow-Bennett controversy of 1845 should possibly be added. Blum in 1906 read an interesting paper on the subject in Vienna and discussed its ætiology. He collected 70 cases of priapism, of which 15, including his own case, were due to leukæmia. Scheuer in 1911 made a very comprehensive survey of the condition, and gave a

short history of each of the 140 cases of priapism he had found recorded. The number of cases complicating the blood disease was 36, and several not mentioned by Blum were added to those occurring between 1906 and 1911. In December, 1914, Hinman in America stated that there had been up to that time 170 cases of priapism in the literature, 45 of which had definitely complicated leukæmia.

He does not give the references, and I am only able to find 39 cases reported by writers whose names appear in the reference list at the end of this article. There are probably a few more cases, which, owing to the war, have not found their way into the "Index Medicus," but Osler's statement that "priapism is a curious symptom which has been present in a large number of cases" is in the nature of an exaggeration, seeing that he states that "the disease is not very rare."

I am indebted to Mr. Arthur Cooke for allowing me to report the following case, admitted to Addenbrooke's Hospital under his care when I was house surgeon there, in June, 1921. By his request the treatment was undertaken by Dr. Ernest Lloyd Jones.

History.—X. Y., a bootmaker aged 31, was admitted to hospital on June 6th, 1921, complaining of an "erection" of his penis which had persisted with no alteration for six days. He had wakened up in the morning and had got out of bed to pass water. On returning to bed the "erection" took place and was not accompanied by any sexual desire, indeed, he had neither had, nor desired any sexual intercourse with his wife for at least 11 weeks. Similar "erections" had occurred, under more or less the same circumstances, four times previously, and on one occasion had persisted for at least two hours. There was no history of any injury. He had been in Mesopotamia during the war, and had had malaria once and sand-fly fever twice. In September, 1920, he had "pleurisy" which lasted for two months, and in April, 1921, he complained of a very sharp pain in his left leg, which lasted two or three days. He denied ever having had syphilis or gonorrhœa, and had two healthy children.

Condition on Admission.—Patient looks pale, unintelligent, and unhealthy, and is obviously in great discomfort. He lies with an anxious, tired expression, accentuated by his hare-lip, with his thighs drawn up and with his knees flexed. Besides the great pain and discomfort he complains of a headache at night. Pain has not been relieved by purging or local fomentations, and even morphia has failed to give him sleep. There is no history of loss of weight, or increasing weakness, or bleedings from any mucous membrane.

Examination.—Teeth: Decayed; pyorrhœa alveolaris. Chest: Glands size of marbles in both axillæ; otherwise no appreciable disease. Abdomen: Spleen reaches down to level of umbilicus and to within 1½ in. of mid-line, being firm, sharply defined, smooth, and not tender. Liver enlarged, reaches 1½ in. below costal margin in nipple line, being smooth, not tender, with border difficult to palpate. Penis erected, lying close to the lower abdominal wall and almost reaching to level of umbilicus; not turgid; does not feel hot; not painful when touched, but only when attempt is made to move it; corpora cavernosa board-like, but corpus spongiosum apparently normal; ischio-cavernosus muscles very hard. A rubber catheter passes easily, and the man can, with some difficulty, pass his water. Prostate not enlarged; nothing abnormal found per rectum. Nervous system: No appreciable disease. Urine: A varying amount of uric acid and urates.

—	Date in 1921.						
	30/6	8/7	12/7	19/7	25/7	2/8	9/8
	Thousands.						
R.B.C. ..	3600	2040	950	1070	1620	1800	1710
W.B.C. ..	2008	1020	650	690	550	422	470
	Percentages.						
Polymorphs	—	60	—	50	58	53	54
Myelocytes	—	33	—	40	34	40	38
Lymphocytes (small) ..	—	4	—	5	5	3	2
Eosinophils	—	2	—	3	2	2	3
Mast ..	—	1	—	2	1	2	3

R.B.C. = Red blood cells. W.B.C. = White blood cells.

Treatment.

6/6/21: Deep $CHCl_3$ anæsthesia (no improvement); pot. brom., gr. lx.; chloral hyd., gr. xxx. 7/6: Three leaches to penis (bleeding continued freely, with fomentation, for seven days). Atropin, gr. 1/50; pot. brom., gr. xxx., and chloral hyd., gr. xv., increased from four-hourly to two-hourly. 9/6: Lumbar puncture: fluid clear, limpid under slight pressure, 2 c.cm. of 5 per cent. novocain injected intrathecally; no improvement. 10/6: Liq. episplasticus to lower lumbar region. 13/6: Corpora cavernosa less hard. Patient complains less of pain. Drowsy, but still miserable and painfully uncomfortable. 22/6: Benzol, ℥i., in capsules, with olive oil; omne nocte post cibum. 28/6: Discontinue benzol. 12/7: Repeat benzol. 14/7: Penis apparently normal. 5/8: Discontinue benzol. 6/8: 0·15 gm. N.A.B. ex. 20 c.cm. distilled water. 9/8: Repeat N.A.B. 12/8: Repeat N.A.B.

Condition on Further Examination.—I had the opportunity of examining the patient in November, 1921. He was paler and looked decidedly more "ill" than when I saw him last. The strain of a recent journey to the seaside had caused severe œdema of his scrotum, thighs, and legs. The spleen extended to the iliac crest on the left side, but not to the mid-line, while the liver reached to 7 in. below the right costal border, in the mid-axillary line. He was an invalid and had to remain on his couch, any exertion causing him palpitation and shortness of breath. His penis was small, symmetrical, and gave no evidence of inequality of consistency. He had found "erection" impossible and he was impotent, being neither desirous nor capable of consummating the sexual act.

Remarks.

Here we have an example of priapism constituting the first symptom of myelogenous leukæmia. The patient never complained of bleeding from his nose or gums, nor was blood visible in his stools. The blood count was high, for, although the count of 2,008,000 on June 30th was almost certainly inaccurate, later careful counts showed 1,020,000 leucocytes in 1 c.mm. of blood. It is stated that an analogous condition is sometimes met with in females, and that prolonged erection of the clitoris, unaccompanied by sexual excitement, occasionally occurs in leukæmia. I have not been able to find such a condition reported. Gardner's case is unique, in that it was of the lymphocytic variety, 95 per cent. of the 1,014,000 leucocytes being small lymphocytes. Otherwise all reported cases of priapism due to leukæmia present a striking similarity. Previous attacks are mentioned in a large number; sudden onset at night befell 11 victims; the duration of the priapism in 80 per cent. of the cases was from 20 to 60 days; and the period of life usually affected was between the twentieth and fiftieth years. In parenthesis, it is interesting to record that the youngest patient to suffer from priapism was a congenitally syphilitic babe a few days old, while the oldest was a man aged 75 years. Pain in all leukæmic cases was a constant feature; sexual desire was never present; ejaculation was never observed; and coitus aggravated rather than relieved the symptoms. Urination was always difficult, but usually possible, and almost without exception only the corpora cavernosa were involved.

It is worth noticing that in five cases of incomplete erection, due to fracture of the spine at the level of the cervical portion of the cord, the corpora cavernosa alone were affected. On stimulation of the glans penis, however, a complete erection took place, which gradually passed into the former state.

Priapism is not synonymous with "prolonged erection" or with satyriasis, but is a condition in which the penis is erected without there being any associated sexual excitement. It may be caused by many conditions, and I will give the classification which Blum suggested, rather than the more complete one of Scheuer.

1. *Local Conditions in the Penis.*—(*a*) Of an inflammatory nature—e.g., periurethritis and urethritis (gonococcal); (*b*) new growth; (*c*) injury; (*d*) result of changes in the circulation—e.g., thrombosis.

2. *Nervous Conditions.*—(*a*) Organic, such as early tabes and G.P.I.; (*b*) functional, including the "priapismus amatorius" of Darwin, and the so-called "epileptic" cases.

3. *General Conditions.*—(*a*) Intoxications as caused by alcohol, cantharides, and other aphrodisiac drugs; (*b*) infectious diseases (cases reported by Lyssa); (*c*) constitutional and blood diseases. Although diabetes is frequently cited as a cause of priapism, Blum was unable to find a single case recorded. It is in this subdivision that leukæmia comes.

Theories of Explanation of Priapism.

There have been two theories advanced in explanation of this condition. The one, due to Salzen, suggests that it is due to pressure on some part of the course of the nervi erigentes, either by the more than normally viscid blood, or by the enlarged lymphatic glands. The other, subscribed to by Ward, Weber, Blum, and others, is that the condition is due to thrombosis in the corpora cavernosa. Objections raised to the first theory are: (1) That it seems incredible that such nervous stimulation could persist for so many weeks; (2) that the erection is not accompanied by the usual psychic phenomena; and (3) the corpus spongiosum has, in all recorded cases, remained more or less normal, and the corpora cavernosa alone have been involved. The latter two objections are not really valid, as will be shown further on.

To the second theory the following objections are brought forward: (1) In many of the cases the priapism has been preceded by shorter periods of erection. In the case I am recording, such erections had occurred four times, and had lasted at least two hours on one occasion. (2) If all the blood in both corpora cavernosa were thrombosed, one would expect pain, tenderness, and turgidity of the organ, and possibly suppuration and local gangrene. (3) It is unusual that this thrombosis should occur only in the penis, and not in other parts of the body.

Normal Penile Erection.

In order to understand the various factors in the causation of priapism, it is necessary to know the mechanism of normal penile erection. This is very complicated and not yet fully worked out. Most of the information given here is derived from Nagel's or Schafer's physiology, and the credit for the work is chiefly due to Eckhard. The nerves concerned are those from the lumbar and sacral regions of the cord. From the lower lumbar region a sympathetic communication goes to the sacral ganglia, from which grey rami communicantes proceed to the pudic nerves. A few fibres from this region join the hypogastric nerve, and joining the pelvic plexus, cause, when stimulated, a strong contraction of the penile arteries. The sacral nerves may also be divided into two groups —visceral and somatic. The former are the nervi erigentes, and they cause, when stimulated, a dilatation of the penile arteries and an inhibition of the plain muscle which they supply—i.e., the anal canal and lower portion of the rectum. The somatic fibres supply the ischio- and bulbo-cavernosus and the constrictor urethræ muscles. The organs such as the bladder and vesiculæ seminales receive their supply from the third, fourth, and fifth lumbar nerves through the mesenteric ganglion. This mechanism, therefore, may be set in motion either through impulses from above or from peripheral stimulation. It has been shown that in a dog the whole of the lumbar and the upper part of the sacral regions of the cord can be destroyed, without destroying the local sexual reflex action caused by stimulation of the glans penis. We also know that in some types of inversion—e.g., fetichism—central inhibition prevents any response to normal local sexual stimulation. Moreover, as we should expect, violent stimulation of the other areas supplied by the nervi erigentes, such as the lower portion of the rectum, by the process of "overflow of stimuli," may cause erection of the penis.

Factors Influencing Erection.

Sexual selection is a very complicated and difficult physiological and psychological study. Havelock Ellis makes it clear that in it are concerned the senses of touch, smell, sight, and hearing, and he shows that they are all capable of exerting an influence on sexual excitement. Truly catholic, then, must be the nervous paths which influence the nervi erigentes. Added to this the memory, the storehouse of the impressions of the senses, is, in the absence of other stimuli, capable of causing sexual tumescence. Of great interest in this connexion are the five recorded cases of priapism in association with nasal polypi, and the case of spermatorrhœa following submucous resection referred to by Ellis. Clearly any conditions that normally cause erection may abnormally cause priapism. The corpora cavernosa are sponge-like bodies lined by the same type of epithelium as the capillaries, and supported and surrounded by a fibrous investment which sends off trabeculæ into their substance. The spaces so formed have free communication with one another, and are, to a certain extent, comparable with tortuous veins. The arteries which supply them are the arteria dorsalis penis and the cavernous branches of the pudic arteries, the latter being much the more important. These arteries divide into the helicine arteries of Müller, and into capillaries, both varieties ending in the sponge-like spaces. The blood is drained away by venules entering the dorsal vein at different positions, but chiefly by veins entering the pudic plexus. Eckhard showed that erection was actually caused by dilatation of the penile arteries, and could not be caused by ligature of the penile veins. François and Frank obtained erection in dogs by stimulating the nervi erigentes, and detumescence by stimulating the pudendic nerve. They also showed that there was a latent period of two and a quarter seconds after the stimulation, before the erection took place; that the penis when erected contained from 8 to 15 times the normal quantity of blood; and that shortly after erection the pressure in the penile veins rose very considerably.

It is suggested that the dilatation is caused by contraction of the longitudinal fibres of the arteries innervated by the nervi erigentes, and that contraction is due to the circular fibres. It seems almost necessary by this hypothesis to assume that the penile arteries are always, except for brief and occasional periods, in "tone." The relation of hormatones to this problem is not yet investigated, but we do know that sexual precocity accompanies adenoma of the adrenals, and that adrenalin has a very marked effect on some portion of the "nerve-endings" to plain muscle. We can at least say, though much work still requires to be done, that a "balance" between the various factors is normally maintained, and that this balance is temporarily upset in tumescence. In many diseases, such as gout, tabes, G.P.I., diabetes and leukæmia, the later stages are associated with a diminution of sexual desire. Whatever may be the various factors concerned, whether chemical, or nervous, or both, we may term the condition an abnormal male "menopause." It is not unnatural to assume that in this change the "balance" is upset—and not always evenly—causing dilatation of the penile arteries and erection. Indeed, the wonder is that it does not occur more often. With such a hypothesis there is no reason why sexual excitement should accompany this phenomenon, or why the corpus spongiosum should be affected. In 11 cases on record, after the priapism had disappeared, ejaculation occurred before the power of erection returned, which strongly suggests that different nerve paths are concerned in the two acts. The probability is that in normal events the corpus spongiosum is not affected until ejaculation takes place, and therefore the usual remark in the recorded cases of priapism "that only the corpora cavernosa were affected" is only what one would expect if the condition were simply due to a temporary alteration of the blood-supply to the organ. The "board-like" contraction of the ischio-cavernosus muscles may be accounted for by supposing a condition of cramp, or by assuming that the contraction is secondary to the erection—secondary, that is to say, either to the actual mechanical stretching of the penis or to the associated nerve impulses. With this explanation it is not altogether inexplicable that priapism should occur from injury, sexual excess, nervous diseases, old age, aphrodisiac drugs, gout, leukæmia, new growth of the penis, urethritis, nasal abnormalities, cerebral tumours, and other pathological conditions, but except in the case of new growth or injury of the penis the cause is almost certainly "nervous."

Thrombosis.

The three main factors concerned in causing thrombosis are: (1) Slowing of the blood-stream and eddies; (2) injury to the epithelium of the blood-vessels; (3) alteration in the physical and chemical condition of the blood. In leukæmia there are marked chemical and physical changes in the blood, and the viscosity is very materially altered. In the Addenbrooke's case there were roughly 500,000 myelocytes per c.mm. of blood. The cross diameter of a myelocyte is about 12 μ, while that of an ordinary capillary is from 6–8 μ. Considering these facts, and the abnormal pressure and quantity of blood in the penis, the conditions would be favourable to thrombosis. There was, however, no fluctuation detected at any time, and certainly the blood drawn off by the leeches, assuming it came from the corpora cavernosa, gave no suggestion of thrombotic changes. In Blum's case a small area of fluctuation was detected and a small quantity of altered blood was aspirated. Goebel and Kast each had a case in which they were able to detect after death signs of thrombosis, both macroscopically and microscopically. Weber and Dyce Duckworth and others believed thrombosis to have occurred in their cases, but offer no reasons or suggestive evidence. Hinman states that in his case about 2 oz. of thick grumous blood-clot was removed, and claims that in all cases in which incision and drainage had been tried similar material had been removed. On the other hand, Lewis simply ligatured the dorsal artery of the penis, and the condition cleared up.

In conclusion, it seems probable that priapism, malignant and traumatic cases excepted, is always due to "nervous" causes, and does not usually persist for more than ten days. The condition is favourable to thrombosis, and partial or complete thrombosis may take place, particularly in those cases in which the blood is considerably altered, as in leukæmia. The evidence is not at all convincing that anything like a complete thrombosis usually takes place, even in the leukæmic cases. The treatment recommended by Hinman in the leukæmic cases and in others where thrombosis is feared is free incision. The incision should be made on the dorsal aspect of the penis and on its proximal half, mid-way between the mid-line and the outer side. The incision should be deep enough to remove all the "thick grumous material." This operation relieves the condition immediately, and does not preclude the possibility of normal erection after recovery has taken place, although sexual intercourse may be prevented by the consequent abnormal curvature of the erected organ. This treatment undoubtedly saves a lot of suffering, and in the leukæmic cases may be justified, seeing that over 50 per cent. of the cases become impotent. Short of surgical interference, which must be carried out with very special aseptic precautions, no local treatment is of any avail, as the great number of suggested remedies so adequately testify. Benzol did seem to act beneficially in the Addenbrooke's case and certainly reduced the number of white as well as of red blood corpuscles. Hypnotics in large doses are required; otherwise treatment on general lines, with especial attention to the bowels, is the only course open to the physician.

References.—Adams: Inaug. Diss., Bonn, 1894. Blum: Wiener klin. Woch., 1906, xix., p. 1133–1139. Carpenter, A.: THE LANCET, 1880, ii., p. 173. Duckworth: Trans. Clin. Soc., London, 1892, vol. xxv., p. 97. Dujon (2nd case): Revue de Chirurg., 1910, p. 1189. Edes: Boston Med. Jour., 1871, Bd. lxxxv. Eisenstädler: Wiener med. Wochenschr., 1907, No. 15. Ellis, Havelock: Psychology of Sex. Favera, Dalla: Monatsch. f. prakt. Dermat., Hamb., 1908, xlvii., 13–21. Gardner, G.: Tr. Amer. Ass. Genit. Ur. Surg., N.Y., 1915, x., 1–3. Goebel (1st case): Mitt. aus den Grenzgeb. d. Med. u. Chir., 1904, Bd. xiii. Gunckel: Amer. Med. Philadelphia, 1906, xi., p. 27. Guttmann: Berl. klin. Wochenschr., 1891, No. 46. Haillot and Viardin: Bullet. Méd., 1904, No. 72. Hinman: Annals of Surgery, December, 1914. Jadioux: Gaz. des Hôpitaux, Paris, 1845, p. 626. Kast: Zeitsch. f. klin. Med., 1895, Bd. xxviii., p. 79. Kétle: Orvosi Hetilap, 1883, No. 9. Klemme: Inaug. Diss., Cassel. 1863; Schmidt's Jahrbücher, 1866, Bd. cxxxi., p. 173. Koschel: Ref. Berl. klin. Woch., 1908, No. 18, p. 896. Knust: Med. Klin., 1907, iii., 45. Leube: Spec. Diagnose, Leipzig, 1895, p. 312. Lonquet (2 cases): Progrès Médical, 1875, p. 447.

(*Continued at foot of next column.*)

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF
IMPACTION OF THE PHARYNX BY A WATCH.

BY PHILIP E. HILL, M.R.C.S., L.S.A.,
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THE following case of a watch impacted in the pharynx during an attack of acute delirious mania in a patient suffering from pneumonia merits record.

On May 31st I was urgently called to a man, aged 32, suffering from pneumonia, who had swallowed a watch. On my arrival I found him controlled by two men. He was cyanosed, struggling violently, and in great distress. I passed my finger down the pharynx and felt the watch lying transversely and hooked my finger into the bow, but owing to the patient's violence it was impossible to dislodge it. I then passed a pair of curved forceps with the same result, when suddenly the heart failed and he fell back dead.

Had this man been sane it is doubtful if he could have succeeded in wilfully destroying himself by thus mechanically blocking up his throat.

A NOTE ON
AN UNUSUAL EFFECT OF NOVARSENOBILLON.

BY MARY O'BRIEN BEADON, M.B., B.S. LOND.
(*From the Victoria Hospital, Triplicane, Madras.*)

THE following is a brief note on a hitherto unreported effect of N.A.B. In this hospital we have been in the habit of giving N.A.B. regularly for the past six to eight months, and the technique used is that which I saw in the out-patient department of the Lock Hospital, London—i.e., the solution is made with sterile normal saline, and injected by means of a syringe into the selected vein. We have occasionally had trouble in getting into the vein, as the average Indian woman's veins appear to be very small and fine, but in no case had we noticed the effect which I am about to report, even though some of the solution found its way into the tissues.

We advise out-patients having injections to take a purgative the day before, to have a very light breakfast, to keep as quiet as possible all day after the injection, and to report their condition next day. All N.A.B. injections are given in the morning, usually in pairs—i.e., the contents of a 0·9 g. phial are dissolved in 20 c.cm. sterile saline, and 10 c.cm. given to two patients, who are ready waiting while the drug is being dissolved. The untoward effect was first noticed in the case of injections given on May 24th.

In two cases injected on this date the veins were large and easily entered, and the injections were given as usual. There was no apparent ill-effect at the time of injection, but on the next day an area about the size of the palm of the hand, situated in front of the elbow where the injection had been made, was found to be dark brown and vesicating. It looked as if the part had been burnt with chloroform. In one case

(*Continued from preceding column.*)

Markow: New York Med. Jour., 1885. Mathias: Allgem. Med. Zentralzeit., 1876, Nos. 97–98. Müller: Deutsche Zeitschrift f. Nervenheilk., 21, 1902. Nagel: Physiology, Bd. ii., p. 69. Neidhardt: Allgem. Med. Zentralzeitung, 1876, p. 682. Osler: Principles and Pract. of Med., p. 743. Peabody: New York Med. Jour., 1880, vol. xxxi., p. 463. Rokitansky: Lehrbuch der Pathol. Anat., Bd. iii., p. 407. Salzer: Berl. klin. Wochenschr., 1879, No. 11, p. 152. Scheuer: Archiv f. Derm. u. Syph., 1911, 109, p. 449. Schulze (2 cases): Deutsche Arch. f. klin. Med. Bd. liii. Stanjeck: Inaug. Diss., Leipzig, 1909. Steuber: Diss. Berlin, 1889. Stevens, W. M.: THE LANCET, 1905, i., p. 153. Sticker: Zeit. f. klin. Med., 1888, Bd. xiv., p. 80. Stimson: New York Med. Jour., 1885, t. xli., p. 676. Vorster (1st case): Deutsche Zeitschr. f. Chir., 1888, p. 173. Ward, A. H.: THE LANCET, London, 1897, vol. i., p. 1143. Weber: Edinburgh Medical Journal, September, 1898. Weinerek: Casópis Lakini ceskych v. Praze, 1907. Wetherell: Med. Rec., New York, 1880, t. xviii., p. 192.

the temperature rose to 100·2° F. after the injection, but there was no other trouble. On the 30th 0·9 g. was divided between two patients, the first of whom had had the slight skin reaction the previous week; the second had not had a previous injection. The first patient was apparently normal at the time of injection, but the next day she returned reporting that she had been very unwell with fever and vomiting all the afternoon after injection, and her arm showed a large brown vesicating patch. The patient would not stay in hospital, and the arm became septic and took several days to heal. The second patient presented no difficulty as regards injection, but almost as soon as the needle was withdrawn one noticed tiny brown patches appearing over an area of about 1¼ by 2¼ inches. This did not develop further at the time; by the next morning this pigmentation had faded, and soon disappeared. The first patient injected on May 30th was the only one who showed real toxic symptoms; the other three had only a local reaction.

This effect is apparently caused by some change in the N.A.B. due to heat; it can scarcely be an oxidation change, as only one patient showed toxic symptoms. In all the cases reported the N.A.B. was of a normal colour, and there was no sign of damage to the phial before opening same. I have since been informed that orders have been issued by the Public Health Department of Madras that all N.A.B. must be kept on ice in the hot weather. It would be interesting to know if others have observed the ill-effect here reported, and if the N.A.B. can safely be used in cold weather after passing through the Indian hot season. It is puzzling to know how the N.A.B. can be affected, since the phials are hermetically sealed.

Reviews and Notices of Books.

INTERNAL SECRETIONS.

Internal Secretions and the Ductless Glands. Second edition. By SWALE VINCENT, M.D. Lond., F.R.S. Edin., Professor of Physiology, University of London. London: Edward Arnold and Co. 1922. 25*s*.

THE first edition of this book was published in 1912, and in the present volume a record is made of the many material changes which have occurred in some aspects of the subject of the internal secretions since that date. In his preface the author utters a word of caution. He is convinced that a sure road to sound knowledge lies in the direction of rigid criticism and a reasoned scepticism, and this attitude he adopts throughout the book whenever experimental investigation gives, as it frequently must, any loop-hole for doubting the usual interpretation of the results. This attitude is in refreshing contrast with that of writers who have built up elaborate theories as a result of hasty judgments based on imperfect knowledge. This book will act as a useful corrective to those who imagine that they have learnt the secret of the functions of the internal secretions.

Taken seriatim, Chapters I.–IX. are practically identical in this volume with those of the first edition. Chapter X. has been largely rewritten and some interesting experimental data are given suggesting that the corpus luteum aids in the fixation of the embryo by favouring the growth of the deciduoma in response to the stimulus of the ovum, and, further, that the hormone of the corpus luteum has a definite influence on the growth of the mammary gland. Prof. Swale Vincent, however, is very cautious on the question of the clinical value of ovarian extracts. Chapter XI. gives an adequate description of the comparative anatomy of the adrenal bodies, followed by an exhaustive account of experimental investigations into the effect of adrenal extracts. The pathology of Addison's disease is fully discussed. It is pointed out that the cortex of the adrenals is the essential part of the gland as far as maintenance of life is concerned; in some animals removal of the medulla does not necessarily cause death. In Chapter XIII. a good deal of new matter relating to the thyroid and parathyroids is introduced. The antitoxic action of thyroid secretion in all probability depends on its function of stimulating metabolism. Prof. Swale Vincent considers that the relations between the thyroid and sexual organs are uncertain, and that they will only be fully understood when the functions of the adrenals are better known. He thinks the calcium theory of parathyroid function not sufficiently proved, and throws doubt on the view generally held that the thymus is a lymphatic organ, also, and no doubt rightly, on the supposed relation between the testicle and thymus. He is not convinced that cases of so-called thymic death are of thymic origin. Diseases of the pituitary gland are discussed fully in Chapter XV. The final chapter deals with the inter-relationships of the organs of internal secretions. Here again the author introduces a note of caution, for the many theories and suggestions which have been put forward are out of all proportion to the established facts. The supposed relationship between the thyroid and pituitary is not proved.

The illustrations are very good and the whole volume is an excellent example of painstaking research and cautious interpretation on a subject full of pitfalls.

Innere Sekretion. Fourth edition. Vol. I., Part 1, and Vol. III. By Prof. Dr. ARTUR BIEDL, Director of the Institute of General and Experimental Pathology at the German University of Prague. Berlin and Vienna: Urban and Schwarzenberg. 1922. Pp. 338 and 480. M.540 per volume.

IT is not stated in how many parts the three volumes of this classic will appear in the fourth edition, but the author says in his preface that for the present it is only possible to publish the portions which are here reviewed; separate publication of these was resolved upon partly to meet the continual inquiries for a new edition, and in part to supply an account of the advances in knowledge which were made during the war, and over the post-war period, when access to literature was difficult. But the hope is expressed, and we heartily endorse it, that the whole edition will soon be completed. Those who are not familiar with former editions may gather some idea of the comprehensive nature of the book from the fact that Vol. III. consists entirely of bibliography, mostly fairly recent, and comprising papers which appeared up to the middle of 1921. From this colossal compilation, however, literature previous to about the middle of last century is omitted almost entirely. On glancing through this bibliography, we have been able to detect no omissions of moment, and we think that the author has placed the medical world under a debt of gratitude on account of the complete bibliography alone.

The other part of the work now available is no less excellent; the same great care has been taken to render it accurate, interesting, and complete. Prof. Biedl, in dealing with the subject which he has made his life study, exhibits a manifest breadth of view. He deals first with general principles, and then commences the special study of the internal secretions with an account of the thyroid and parathyroid bodies. Though the general principles of the subject are now pretty well known, the author, even in this field, gives us much to think about. For example, the Eppinger and Hess theory of vagotonia and sympathicotonia, is fully discussed in its relation to the internal secretions, and the views as here digested will prove of considerable interest to English readers. The postulates which should be satisfied before it can be said that an organ extract contains a hormone, are also borne well home. These are: (1) It must be susceptible, to some extent at least, of chemical isolation; and (2) it must be shown that the same substance is

actually liberated from the organ in the body. They are not infrequently forgotten or ignored by some writers on endocrinology.

In the section dealing with the parathyroids, considerable space is devoted to the clinical aspects of parathyroid disease, and particularly to tetany; the subject is treated in a thoroughly modern and exhaustive way, and the volume is worth purchasing for this section alone.

Die Innere Sekretion. Eine Einführung für Studierende und Aerzte. Second edition. By Dr. ARTHUR WEIL, formerly Privatdozent in Physiology in the University of Halle; Physician to the Institut für Sexualwissenschaft, Berlin. Berlin: Julius Springer. 1922. Pp. 146. 4*s.* 4*d.* (5*s.* 8*d.* bound).

THERE is little change in this work since the first edition appeared last year. The book can be confidently recommended to those who wish for a good work of convenient bulk in the German language. No attempt is made to present the subject in an exhaustive manner; we have merely a digest of the present position. The author has done his work well, and has tried his best to incorporate the results of investigations which have been pursued in countries other than Germany. The order of treatment of the subject is worthy of note. Instead of dealing exhaustively with the ductless glands seriatim, the various bodily functions as they are affected by the activities of the ductless glands are studied. Thus we have the blood, circulation, respiration, metabolism, growth and form, reproduction, sexual and psychic phenomena, as dependent on the activities of the organs of internal secretion. Then the properties of the various internal secretions, their mutual relations, and their relations to the central nervous system, are discussed. The treatment is logical and stimulating, and we may congratulate the author on the production of a book of outstanding merit. The illustrations, of which there are 45, are excellent, and the general style of the production is up to the best standard of pre-war German publication.

NOUVEAU TRAITÉ DE MÉDECINE.

Publié sous la direction de MM. les Professeurs G.-H. ROGER, F. WIDAL, P.-J. TEISSIER. Fascicule II., Maladies Infectieuses. Paris: Masson et Cie. 1922. Pp. 766. Fr.50.

THIS, the second volume of a really comprehensive System of Medicine, is concerned with most of the diseases which are usually spoken of as "infectious" in this country. It is true that the first five volumes are entitled "maladies infectieuses," but, except for the fact that erysipelas and cerebro-spinal fever are discussed in the preceding volume and the enteric group of fevers in that which follows, the worker in a British fever hospital will obtain practically all he wants in these pages and will find this volume a particularly good bargain. The paper and printing are of the best, the binding is adequate, and the illustrations are excellent, though allowance must sometimes be made for the difficulty of securing convincing coloured pictures of rashes. The want of an index is hardly compensated for by an unusually full *table des matières* at the end of the volume.

The first article by Teissier and Duvoir on scarlet fever has many features of interest. The teaching does not always coincide with that of this country. As regards arthritis, for instance, the authors appear to lean to the belief that it is streptococcal in origin, whereas many of us consider it to be toxic rather than septic. They admit that they only recovered the streptococcus from 3 out of 60 cases, against which we may quote the results obtained by J. C. McClure, who in 30 punctures never obtained streptococci; his cultures were sterile except in three instances, in which staphylococci, probably contaminations, were obtained. We may agree more readily with the opinion that arthritis plays an insignificant part in the production of cardiac complications. Teissier considers that scarlet fever itself has only a limited influence on the determination and even on the aggravation of endocardial lesions. In the discussion of the ætiology of nephritis no mention is made of Schick's theory that it is in reality an anaphylactic phenomenon. A question of general interest is the length of isolation in scarlet fever. The authors consider that a patient free of complications and with normal throat appearances may be regarded as free from infection in about four weeks, but only, it would appear, if desquamation is complete, which it very seldom is at such a period. As they have elsewhere stated that desquamation is probably infectious only so far as it has been contaminated by mucus from the throat, the qualification seems somewhat illogical.

Teissier has a short note on Fourth Disease and another on Fifth Disease, a condition resembling rubella and measles first described by Tschamer in 1886, and also claimed as a distinct entity by Escherich at a later date. Neither view can be accepted as proved. The same writer contributes an interesting monograph on measles. The frequency with which Teissier found spirilla in the fæces in cases of enteritis persisting into convalescence has led him to believe that their presence implies a massive and serious lesion of the gut. Small-pox and chicken-pox are both adequately discussed and illustrated, though it is curious that the teaching of Ricketts regarding the distribution of the small-pox eruption is ignored. It is interesting to note that in Teissier's experience the inoculation of the cornea of the rabbit with the lymph of a suspected vesicle gives reliable results—that is to say, that in the case of small-pox the Guarnieri inclusion bodies can be demonstrated, whereas in chicken-pox they do not appear.

Herpes zoster is thoroughly discussed by Ravaut. It is regarded as an infectious disease and probably specific, and the author is convinced that one attack confers immunity, regarding any subsequent manifestations as merely herpetiform eruptions occurring in the course of other affections. The other forms of herpes are also very adequately dealt with. Allusion is made to the recent work of Blanc, who, with a filtrable virus from a herpes vesicle, has been able, by inoculation of the rabbit's cornea, to set up a corneal herpes which can be transmitted from animal to animal.

Anthrax is dealt with by Roger and typhus by Nicolle and Conseil.

Aviragnet, Weill-Hallé, and Marie are responsible for the 150 pages devoted to diphtheria. They prefer intubation to tracheotomy and appear to regard lightly the inconveniences entailed by retained tubes. As regards serum dosage, they recommend intramuscular injection, employing the intravenous method in severe cases. They suggest the dose should be 250 units per kilogramme of body-weight in mild and 500 in more serious infections. Like other French writers, they approve of the use of serum for paralysis should it develop after the original dose may be regarded as having been eliminated. This method has found little support in this country, and the palsies of diphtheria are often so short-lived that it is difficult to estimate the value of any therapeutic measure. The systematic use of adrenalin given subcutaneously for as long as five or six weeks is considered to be of value, strychnine, freely pushed in relatively large doses, being given along with it.

In the section on mumps, by Teissier and Esmein, one of the most interesting chapters is that devoted to the curious reaction of the meninges to the virus of that disease. Of the other monographs we may mention those of Londe on whooping-cough, Camus and Gournay on tetanus, and Barbier on rheumatic fever, all of which will well repay perusal. Those who are especially interested in the infectious diseases will find throughout the volume little differences in methods of treatment, in dietetic measures, and in modes of diagnosis which can hardly fail to stimulate thought and to provoke imitation. The book will be a useful addition to any hospital library.

HORMONES AND HEREDITY.

By J. T. CUNNINGHAM, M.A. Oxf., F.Z.S., Lecturer in Zoology at East London College, University of London. London: Constable and Co. 1921. With 3 plates. Pp. 246. 24s.

THE subtitle describes this book as "a discussion of the evolution of adaptations and the evolution of species." The author reverts to the old theory of Lamarck, which he elaborates with the aid of modern conceptions, especially invoking that of the hormone theory, though, as he says, such an explanation of certain difficulties was lurking under other names for some years before the word "hormone" was coined by Starling. Changes, which later become inherited characters, are not produced simply and solely by physical environmental stimuli as Lamarck supposed, but also by the action of hormones, liberated in increased or diminished quantities as the result of such physical stimuli, or elaborated anew from cells or tissues affected by them. Such hormones have their say in the production of alterations in bodily structure of the growing individual, and may impress these alterations on the gametes for transference to the next generation. The author crystallises his thesis in the following sentence:—

> The heredity of each individual and each type is compounded of variations or changes of two distinct origins, one external and one internal—that is to say, of variations resulting from changes originating in the germ cells or gametes, and of modifications produced originally in the soma by the action of external stimuli, and subsequently affecting the gametes.

The bulk of the argument is derived from a study of the characters of sex, the secondary characters which develop with sexual maturity, or are associated with one or other sex, and a study of the alterations produced in these by changes in the internal secretions of the sexual glands. Attempts are made, and not without success, to elucidate by the hormone theory a number of difficulties which have beset upholders of other theories of heredity, but the inclusion of half a chapter on "evidence opposed to the hormone theory" shows that the final answer to this much vexed question is not yet reached. As solutions to old puzzles are found new ones crop up ahead, but without some such stimulus the evolution of science would end, as would the evolution of species.

The book is readable and contains a wealth of illustrative example, among which is hidden away much of the author's own observation and experiment.

PATHOLOGISCHE HISTOLOGIE.

By Dr. MAX BORST, Professor der allgemeinen Pathologie und der pathologischen Anatomie in der Universität München. Leipzig: F. C. W. Vogel. 1922. Pp. 371. M.300.

THIS book is intended to be used, as the subtitle indicates, by students and practitioners taking a practical course in morbid histology. The author especially disclaims any intention of having written a text-book on the subject, for he has deliberately omitted the subjects of general pathology, such as atrophy, inflammation, cloudy swelling, and so on. He takes each separate organ or tissue in order, describing the various microscopical changes which they undergo in different pathological conditions, dealing with the problems of general pathology as they arise, each section being preceded by a brief account of the normal histology of the organ. Teachers of pathology in this country have been heard to make the complaint of insufficient teaching in histology because—they say—medical students begin their course in morbid histology without a sound knowledge of normal histology. The arrangement in this book suggests that the complaint would find a sympathetic echo in Germany.

The subject-matter is well arranged and very complete. Changes in the bones and in the skin are fully dealt with, and the text, both as regards matter and style, is exceptionally good. The descriptions are clear and concise and free from the meaningless prolixity beloved by many morbid histologists. As an instance we may quote the beginning of the chapter on neoplasms: "The true neoplasms represent autonomous growth excesses of the body. The autonomy expresses itself in the completely unaltruistic character of the tissue proliferation." It would be difficult to define the essential nature of malignant disease more clearly and more succinctly. Numerous excellent figures complete the book, almost all of which are reproduced in colour. This has made it possible to present low power views which give the same general impression as the actual preparations. Of the 240 figures over 50 belong to the section on tumours.

It is to be regretted that in a book which is so well done the organs of internal secretion have been treated with the complete neglect which they too often receive at the hands of pathologists. An English translation of this book would, we believe, be welcomed by medical students and others in this country.

JOURNALS.

BRITISH JOURNAL OF SURGERY.—In the July number Sir D'Arcy Power continues his series of Eponyms, dealing with that form of ulceration of the nipple which bears Sir James Paget's name.—T. P. Dunhill describes a method of removing intra-thoracic tumours by the trans-sternal route, in which the upper half of the sternum was split in half and an osteoplastic flap was turned back, including the clavicle, piece of sternum, inner ends of the first three ribs, and the overlying soft parts; apart from the technique described, the pathology of the three tumours is most interesting.—E. Laming Evans reports the late results of congenital dislocations of the hip treated by manipulation, and in doing so introduces a new classification of results that may be obtained.—H. A. T. Fairbank discusses the late results of all methods of treatment in the same condition. He concludes that:—1. If treated before 3 years of age cure should be obtained in 75 per cent. of unilateral cases and 50 per cent. in bilateral ones with excellent function. 2. Some imperfect results may be converted into cures by making a new upper lip to the acetabulum. 3. Open operation is specially to be considered in the middle age group—i.e., 3–5 years. 4. After reduction he insists that a full six months must be spent in absolute right-angled flexion. 5. It is doubtful if anterior repositions are in any way better off than untreated cases.—C. J. MacAuley discusses acute phlegmonous gastritis, reporting a case, and to this is added a brief note and an illustration of a case of Sir Berkeley Moynihan.—J. J. M. Shaw gives details, well illustrated by photographs, of his methods of treating severe burns of the face and hands by pedicle and moulded inlay grafts; his technique is founded on Gillies's well-known methods.—A. G. Timbrell Fisher contributes a long article embodying his Hunterian lecture on osteo-arthritis. He deals in particular with its pathology, ætiology, and some principles of treatment.—D. P. D. Wilkie and J. N. J. Hartley publish two cases of Pharyngeal Diverticulum, and discuss the treatment. They call attention to the fact that dilatation of either an organic or a functional stenosis must be dealt with in addition to the extirpation of the sac.—L. Bathe Rawling deals with the remote effects of gun-shot wounds of the head in a very full and carefully considered paper, laying stress on the very distressing syndrome from which these patients suffer. The indications for, and the technique of, the required decompression operation are given, and the results analysed. He also discusses the closure of cranial defects, pointing out that complete closure, such as by bone grafting, is sometimes actually deleterious, and describes his own method of using two celluloid plates.—Sir Berkeley Moynihan discusses the early signs and symptoms of cholelithiasis remarking that with the exception of the single

cholesterin stone all gall-stones give symptoms, although slight, long before the onset of the so-called typical signs, which in reality are due to complications such as cholangitis. The single cholesterin stone reveals itself by a sudden acute attack of pain which is quite characteristic.—James Sherren compares cholecystostomy with cholecystectomy, deciding emphatically in favour of the latter.—Visits to the following clinics abroad are described: first, that of Prof. Noordenbos of Amsterdam; secondly, of Dr. Schoemaker at the Hague; thirdly, of Prof. Lamerris of Utrecht.—The following rare or obscure cases are reported: 1. Torsion of the hydatid of Morgagni, by A. J. Walton, in which the symptoms suggested torsion of the testicle, but in which operation revealed a normal testicle, but a twisted and very distended hydatid. 2. Primary jejunal ulcer, by the same author, with symptoms closely simulating duodenal ulcer, and cured by a six-inch resection of the jejunum (three feet from its commencement). 3. Large ureteric calculus, by P. M. Heath, weighing 1075 gr. and measuring nearly four inches. 4. D. C. L. Fitzwilliams reports a case of a strangulated appendix epiploica in an inguinal hernial sac.

PARASITOLOGY. June, 1922.—This number opens with an account by the editor, Prof. G. H. F. Nuttall, F.R.S., of the origin, with a description of the building, of the recently founded Molteno Institute for Research in Parasitology in Cambridge. Previous to the foundation of this institute in 1907, Prof. Nuttall was elected to the Quick Professorship of Biology, founded by Frederick James Quick; finding temporary accommodation in the unfinished portion of the Medical School Museum, he established the Quick Laboratory, where he, with the staff and many research workers, was installed from 1907 till 1919. The premises soon grew inadequate for the increasing number of workers, collections, and books, and in 1919 Prof. Nuttall issued an appeal for help which evoked a generous response from Mr. and Mrs. P. A. Molteno, who offered a sum of £36,000 for erection and maintenance of the institute. The building, erected on the Downing site at Cambridge, was opened on Nov. 20th, 1921, by Earl Buxton, in the presence of Mr. and Mrs. P. Molteno and numerous British and foreign representatives of scientific institutions. The building is provided with several well-fitted research rooms, sterilising, aquarium, and biochemical rooms, a library, research museum, &c., and all necessary apparatus for modern investigations in all the branches of parasitology. The article contains a detailed description, with plans of the whole building by the architect of the institute, and this will be undoubtedly of very great help to all interested or engaged in the erection of a biological laboratory.—A paper by Sadamu Yokagawa deals with the life-history of *Heligmosomum muris*, a parasitic nematode from the intestine of the wild rat. This nematode passes through five stages, two free and three parasitic. The eggs hatch 24 hours after being passed in fæces. The second stage is infective and the infection takes place through the mouth or through the skin. The larvæ reach the lungs, where they remain until from 35 to 65 hours after infection; they then migrate to the intestine, where they grow rapidly, and on the fifth or the sixth day after infection they become sexually mature.—G. F. Ferris and F. R. Cole contribute a complete systematic account of the Hippoboscidæ (*Diptera pupipara*), richly illustrated.—C. L. Boulenger deals briefly with the structure and systematic position of a small Strongyloid nematode (*Heligmosomoides polygyrus*) parasitic in field-mice.—H. Leigh-Sharpe describes a parasitic Copepod (*Medesicaste*), producing tumours in the fish, and Maud Haviland deals with a small Hymenopteron (*Dacnusa areolaris*) parasitic in the body cavity of a fly larvæ (*Phytomyza*), which makes galleries in the leaves of the wild *Angelica*. Finally the number contains portraits and short biographic notes by Prof. Nuttall of Léon Dufour (1780–1865), C. T. E. von Siebold (1804–1885), and John Goodsir (1814–1867).

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT GLASGOW.

(Continued from p. 394.)

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

WEDNESDAY, JULY 26TH.

AT the first session of this section a discussion on

Psychotherapeutics and Psychopathology

was opened by Dr. T. W. MITCHELL (Hadlow), who, in his paper, gave a succinct résumé of recent advances in psychological medicine. Attention was directed to the additions to our knowledge attributable to the experiences of the late war, and in a general way the Freudian theory of the development of the psychoneuroses was accepted. It was pointed out that workers concerned with the psychoneurotics of war could not get away from Freudian theory, even if the superstructure erected on it was not always favourably considered. The only way to explain the pathogenesis of the traumatic neuroses of warfare was to admit the part played therein by repression. In those of civilian life, similarly, the Freudian view is, in Dr. Mitchell's opinion, the correct one. A sketch of the libido then followed, and the claim was advanced that it brought order and cohesion into a department of medicine which had hitherto been confused and ill-organised. No attempt was made by Dr. Mitchell to criticise the libido theory in its bearing on the psychoneuroses, though several objections that have been raised from time to time were somewhat summarily dealt with. Considerable attention was devoted to the part played by psycho-analysis in the correlation of psychopathology with psychotherapy, and the speaker claimed for it a scientific basis lacking in all other methods of psychological treatment. Suggestion, for example, could not be regarded as a rational therapeutic technique. Dr. Mitchell dealt in an interesting way with the apparent paradox that in psychopathology determinism is a necessary postulate, whereas for success in psychotherapy the operator would like to believe in the reality of free-will. He deprecated the introduction into the scientific study of psycho-analysis of any moral or ethical considerations, and ended by quoting the dictum of Freud: "If from ignorance you cannot adjudicate, then you should neither believe nor reject."

Dr. J. A. HADFIELD (London) followed with a paper on "The Making of a Neurotic." He said there were three phases in the neurotic's development: the making of complexes, the structuralisation of complexes, and the conflict of complexes. In regard to the first of these, the speaker claimed that hereditary influence is minimal in proportion to the part played by early experiences—viz., those of the first four or five years of life. He stressed the importance of the environmental factor, holding that in practically all instances the neuroses of later life can be shown by psycho-analysis to have their roots in infantile experiences, and several examples were briefly cited which, he held, supported his contention. Dr. Hadfield, however, admitted the inheritance of instincts and of the nervous temperament. Much attention was paid to the structure of complexes, and to their bearing on disease. It was stated emphatically that the sole cause of nervous breakdown was an endopsychic conflict between opposing complexes, other causes as usually particularised being dismissed or ignored. It was stated, further, that in this respect the points of view of the biologist and the psychologist were essentially dissimilar; according to the former, the neurotic breaks down because he cannot adapt himself to his environment; according to the latter because he cannot adapt himself to himself.

Dr. JANE SUTTIE (Glasgow) read a thoughtful, if distinctly pessimistic, paper on "Mental Stresses of Adjustment in Women," the general thesis of which

was that to the average woman marriage and a career are contradictory propositions. Femininity is an actual drawback to development in the case of the girl who is being educated. The price of economic success, as far as woman is concerned, is celibacy. If a woman does not achieve marriage, she is doubly doomed, because she is not married, and because of her biological and economical inferiority. It was maintained that mothers are guilty of a heterosexual preference for their boys, and that while in this parental relationship both sexes are affected, the girls are more profoundly affected than the boys. Dr. Suttie spoke of girls being embittered and discouraged by sex values, and declared there was relative disparagement of the females as compared with the males in the family. The woman was always handicapped because of her lack of singleness of purpose. No single solution for this alleged state of affairs was to be found. Some women adjusted themselves to reality early, others only with the menopause, others sought refuge in phantasy.

Dr. H. CRICHTON MILLER (London) dealt with "The Psychic and Endocrine Factors in Functional Disorders." Prefacing his remarks with a comment on the usual failure both of neurologist and of psychologist to regard his case dispassionately and without prejudice, Dr. Miller said there was a constant tendency to forget physiological knowledge when we speak psychologically, and vice versa. The psyche cannot possibly be conceived of as a thing which has no relation to physiology. There is a difference between the mentality of the stallion and that of the gelding. He proceeded to emphasise the significance of the endocrine factor in psychological disorder, and the desirability in every case of investigating (1) the inherited endocrine pattern of the individual, (2) individual endocrine history, and (3) his emotional history. Admitting that in the endocrine sphere much was still of necessity largely hypothetical and speculative, and that accordingly empiricism was imperative, Dr. Miller endeavoured to classify types of case on an endocrine basis, and suggested that Napoleon, Mr. Bottomley, and Lord Northcliffe were "pituitary" in their "make up." He said that the thyroid was essentially the "female gland." He spoke of "power-urge" derived from neuroglandular activity, and in contrast to the wholehearted Freudianism of previous speakers, roundly attacked the far too limited Freudian conception of the libido. The human dynamic is much more complex than the sex-libido, which cannot explain all the phenomena. Dr. Miller criticised the narrowness of vision of the psychologist who, finding a cause for psychological symptoms in a disorder of the psyche, ignored toxic and nutritional factors. He concluded with a plea for a larger and more generous view of psycho-pathological ætiology.

These various communications were subsequently discussed by Dr. C. F. HARFORD (London), Dr. R. G. GORDON (Bath), Dr. MURRAY LYON (Edinburgh), Dr. CONNELL (Edinburgh), Dr. WILKINS, Dr. CALWELL (Belfast), Dr. HELEN BOYLE (Brighton).

THURSDAY, JULY 27TH.

Treatment of Neurosyphilis.

The discussion was opened by Sir JAMES PURVES STEWART, who after devoting some attention to preliminary considerations on the exact meaning of neurosyphilis and its diagnosis, on the question of a possibly neurotropic organism, and on the clinical varieties of the disease, dealt in a remarkably complete fashion with various types of treatment that have at one time or another been favourably reported on. The modern treatment of neurosyphilis does not imply that older remedies should be neglected. For meningovascular neurosyphilis ordinary antisyphilitic treatment cannot be improved upon; the choice in a given case of the variety of mercury and the technique adopted, along with the exhibition of arsenic and of the iodides, will depend on individual factors. In the treatment of parenchymatous neurosyphilis there is greater diversity of opinion. After indicating reasons for the comparative lack of success in such cases, Sir James Purves Stewart proceeded to discuss seriatim the following techniques: (1) Treatment by production of artificial pyrexia. General paralysis has been frequently treated by injections of tuberculin, by inoculation with malaria, by injection with sodium nucleinate—the idea being in each instance to induce a "harmless" pyrexia with leucocytosis and other blood changes calculated to modify or even to destroy the spirochæte and its toxin. The speaker had experience of the last of these, but the results were only moderately encouraging. (2) Treatment by Quéry's monkey serum. Monkeys are injected with filtered bouillon cultures from syphilitic sores, and from these animals blood serum is secured some days later, sterilised, and injected into human cases of the disease subcutaneously or intrathecally. In two personal cases the result was unsatisfactory. (3) Intraspinous treatment. A number of different methods were described. The speaker had sufficiently encouraging results in tabes and in cerebro-spinal syphilis to warrant continuation of this technique. In his opinion the most promising cases for intraspinal therapy are those of meningovascular neurosyphilis; tabetic cases are more favourable than cases of tabetic optic atrophy and general paralysis. (4) Intracranial methods. Of these, special attention was devoted to intracisternal puncture through the occipito-atlantoid ligament, which, according to Sir James Purves Stewart, benefits general paralysis provided the cases selected are early. As a rule some 30 c.cm. of salvarsanised serum are injected once a fortnight.

Dr. KINNIER WILSON (London) followed with a paper entitled "Some Observations on the Treatment of Neurosyphilis." Seventeen years have elapsed since the discovery of the *Spirochæta pallida*, and 12 or 15 since the introduction of "606" and "914"; has there been a commensurate advance in treatment? As far as neurosyphilis is concerned we have been handicapped by our ignorance of the way or form in which the spirochæte remains latent in the nervous tissues or elsewhere, and by difficulty in distinguishing symptoms due to toxic action from those the result of structural defect. Dr. Wilson said that he objected to the common differentiation of meningovascular from parenchymatous neurosyphilis, and maintained that in general paralysis, tabes, and "tabetic" optic atrophy histological evidence showed clearly none can be considered essentially or solely a "primary" neuronal degeneration; in each the changes in the parenchyma follow the inflammatory action of the *Spirochæta pallida* and its toxins. We are on the right lines in our treatment if we aim at reaching and neutralising the effects of the spirochæte itself, though the "incurability" of general paralysis is usually attributed to the inaccessibility of the organism in the tissue spaces of the brain. Probably it is due rather to the fact that the spirochæte gets a start and is never overtaken. Dr. Wilson gave a series of cases of general paralysis, tabes, and cerebro-spinal syphilis respectively, to illustrate success and failure equally. He quoted in some detail one case of general paralysis that had apparently been cured. Reference was made in conclusion to the necessity of recognising that some cases of gumma are better treated surgically than medically.

Dr. W. ALDREN TURNER read a paper based on the investigation of the results of treatment in 200 cases of neurosyphilis at the National Hospital, Queen-square, and made a threefold division of these: (1) In 10 per cent., mainly cases of tabes of long standing, spontaneous abatement of the disease-process apparently occurred, the usual tests being found to be completely negative when the patients came under observation. (2) In 75 per cent., the tests were strongly positive in blood or fluid, or both, and the results of persistent treatment were insignificant. Apparently, however, none of these had been submitted to intraspinous treatment, intravenous technique only having been employed. (3) In 12 per cent., cases of short duration, relatively mild, in relatively young subjects,

marked subjective and objective improvement followed treatment.

Dr. STANLEY BARNES (Birmingham), speaking from the clinical standpoint, said he thought mercurial treatment was nearly as good as combined methods, and was in doubt as to the reputed value of intraspinous technique. It was important to remember that some 10 per cent. of cases of neurosyphilis showed arrest of symptoms without arsenical treatment at all. He was sceptical as to any increase of cures from the utilisation of arsenical preparations.

Sir FREDERICK MOTT also thought there was no proof that modern methods were superior to mercurial therapeutics. He quoted cases of general paralysis in which very long remissions had occurred spontaneously. He spoke favourably, however, of Sicard's method of small doses of intravenous arsenic repeated at very short intervals.

Dr. DOUGLAS K. ADAMS (Glasgow) gave the results of treatment, solely by the intravenous route, in 200 cases of neurosyphilis of different types. Among his conclusions were (1) that a serological cure in blood and fluid can be effected by this method in a sufficient number of cases to warrant its further prosecution; (2) that in the routine treatment of syphilis the cerebrospinal fluid should invariably be examined, whether the patient shows nervous symptoms or not; (3) that there is no evidence that intravenous arsenic in any way leads to worsening of the usual objective tests in neurosyphilitics.

Dr. DUNLOP (Glasgow) gave some details of the Wassermann tests in a large number of cases of neurosyphilis. Of 107 cases of tabes dorsalis, in 30 per cent. the blood showed a negative Wassermann reaction, and in only 10 per cent. was it negative both in blood and fluid. Of 22 cases of general paralysis, seven gave a negative blood test and two a negative fluid test. In 94 cases of treated syphilis there were only six in which the tests were subsequently positive, and of these only one showed symptoms of developing neurosyphilis.

Prof. CARL BROWNING, Dr. DAVID LEES, and Dr. C. A. MCBRIDE (London) also contributed to the discussion.

FRIDAY, JULY 28TH.

Dr. J. H. MACDONALD read a paper on the

Elements of Contrast in the Psychic Mechanism,

in which he discussed the question of the first manifestation of consciousness in the animal series, and followed Bianchi in distinguishing between upper and lower forms. He considered that the higher form is connected with the development of reasoning capacity; the dawn of consciousness in this sense coincides with the dawn of the power of comparing or contrasting present and previous experience. Ability to recall past percepts and to contrast them in consciousness with the percepts of the present constitutes this higher type. Herein lies the difference between rational and instinctive behaviour. Intelligent action on higher levels is the result of the interplay or contrast of ideas "for" and "against." Individual differences depend on differences in the contrasting elements. In the case of the infant, developing consciousness is contemporaneous with ability to differentiate between objects, between comfort and discomfort, and so on. Occasions permitting contrast are constantly arising in his life; he is told, "do this," "don't do that." In nothing is the difference between man and lower forms more clearly seen than in the fact that a thing will remind a brute of its similars but not of its dissimilars; "sunset will not suggest a hero's death, but suppertime." Dr. Macdonald laid stress on the pedagogic aspect of these contentions, and also applied the principle of contrast to analysis of the phenomena of morbid psychology.

The paper was discussed by Dr. GORDON and Dr. BOYLE.

A paper on Spreading Subdural Hæmorrhage, by Dr. DONALD E. CORE (Manchester), was not read owing to the indisposition of the writer.

Dr. ALDREN TURNER read a communication entitled

Epilepsy and Gunshot Wounds of the Head.

The figures so far available from the records of the Ministry of Pensions showed, he said, that out of some 18,000 cases of head injury in warfare only some 800 have subsequently developed epilepsy—i.e., rather less than 5 per cent. Two groups are to be distinguished: (1) True traumatic epilepsy from injury of the skull and brain, associated usually with paralytic symptoms (motor, sensory, or psychical); (2) a less common group in which epilepsy follows a slight head trauma without obvious injury of the skull or brain. In how far cases in group (2) may be attributed to the head injury is a point on which medical boards have expressed different opinions. Dr. Turner discussed true traumatic epilepsy in some detail, excluding focal or Jacksonian convulsions. Epilepsy of this class may follow a wound of any portion of the brain with the exception of the cerebellum. The parietal region provides the greatest number of cases, and there would appear to be a greater tendency for epilepsy to develop after wounds of this area quite apart from the greater frequency of wounds there. Behague states that 14 per cent. of parietal wounds become epileptic and only 7 per cent. of occipital wounds. Neither the extent of the bone lesion nor, apparently, the severity of the trauma influences the development of the seizures. Of 28 cases in which the date of the first seizure was definitely known, fits commenced in 19 at some period between the second and the twelfth month; in the remainder the onset was at any time from the end of the first year up to two and a half years after the wound. In frequency and character the fits resemble those of ordinary "idiopathic" epilepsy. In nearly all the cases some change was noted in the mental condition: memory defect, impairment of concentration, an anxious outlook, and "nervousness" were commonly associated symptoms, irrespective of the site of the wound.

The contention that the local conditions at the seat of wound may be the exciting agent in the production of the fit receives support from the observation that freeing the cicatrices from the scalp and the introduction of a bone-graft or celluloid plate may arrest the attacks in some cases. Yet a very large number of ex-Service men have received severe gunshot wounds of the head in war with extensive destruction of the skull, "anchoring" of the brain, and associated paralytic symptoms, who have not developed epilepsy. It is therefore difficult to avoid the conclusion that something more than local tissue alterations are requisite for the production of the seizures of traumatic epilepsy; and the determining agent, in Dr. Turner's opinion, is an inherited or inborn constitutional predisposition to nervous instability and epilepsy.

Dr. KINNIER WILSON spoke of the occurrence of psychogenic epilepsy as being well recognised long before the war. He said it was abundantly clear that trauma per se was insufficient in pathogenesis; speaking generally, the importance of trauma in the production of nervous disease was greatly overrated. Out of hundreds of cases of gunshot wound of the head he had never seen a case of cerebral tumour derived therefrom. In respect of traumatic epilepsy, therefore, he attributed fundamental significance to the heredity and constitutional make-up of the individual concerned.

Dr. GORDON said he had found evidence of a neuropathic diathesis in 75 per cent. of the cases of traumatic epilepsy that had come under his care.

Dr. BARCLAY (Edinburgh) and Dr. HUMPHREY (Glasgow) also took part in the discussion.

SECTION OF MICROBIOLOGY.

WEDNESDAY, JULY 26TH.

AFTER a few introductory remarks the President, Dr. R. M. BUCHANAN, called upon Dr. F. D'HERELLE to read his paper upon the

Nature of the Bacteriophage.

Dr. d'Herelle said that the phenomenon upon which he was about to open the discussion depended upon the presence in the intestinal contents of all living beings of "principles" which have the property of dissolving certain bacteria; amongst other properties possessed by these principles is that of passing porcelain filters by which means they can be separated from the intestinal contents. Once the solution of bacteria by this agent is initiated the phenomenon is transmissible in series indefinitely. For the purposes of this discussion he intended to confine himself to only one of the aspects of this phenomenon—its essential nature. Any explanation put forward must suffice to explain all the experimental facts before it could be accepted. There were four current theories, supported by different workers, which purported to do this. These he would examine in detail in the light of the known facts. Bordet and Ciuca believed that the phenomenon was due to the enzymes derived from the animal organism in response to the presence of the bacteria, the source of origin, for these workers, being the leucocytes. Others believed that the enzymes in question resulted from bacterial antagonism and were derived from other intestinal bacteria. The third hypothesis, especially associated with the ideas of Weinberg and Aznar, sought to explain the phenomenon by a secretion of autolytic enzymes by the bacteria themselves, under the stimulus of an external and unknown cause.

The fourth theory, which is that of the author himself, is that the lysis results from enzymes secreted by an ultra-microscopic virus, living as a parasite upon the bacteria. Turning to the experimental facts which require explanation, Dr. d'Herelle adduced the following as evidence of the correctness of his theory of a living ultra-microscopic virus. Firstly, the dissolution of the bacteria under the influence of the bacteriophagic principle occurs in series which can be carried on indefinitely, a regeneration of the active agent occurring at each such passage. This fact would dispose of the first two of the suggested explanations. Secondly, when acting in an attenuated state in young, actively growing, surface cultures, the bacteriophagic principle produces bare areas amidst the growth, which are analogous to colonies and are to be looked upon as colonies of the bacteriophage. Thirdly, all strains of the bacteriophagic principle are antigenically identical, irrespective of what organism they may be grown at the expense of. Fourthly, the virulence of the principle is variable and capable of being changed: this property is essentially that of a living organism. It is found that the behaviour of this lytic principle towards physical agencies and chemical reagents corresponds more closely to what would be expected from a living organism than from an enzyme; it is, for example, destroyed by glycerine, which preserves many enzymes. It is also possible to obtain the enzyme actually causing the destruction of bacteria in such a state that the lysis produced is not transmissible; it is believed that in this case the living virus has been destroyed whilst its active enzyme has been separated from it and preserved. The great mass of diverse facts brought forward are only capable of explanation on one assumption—i.e., that the active agent is a living substance. The phenomenon described by Twort, and often considered to be identical with the d'Herelle phenomenon, has not the same features. In the case of the former the organisms undergo a visible change into a transparent material; in the case of the latter they are entirely destroyed. It is possible that Twort's phenomenon is due to lytic substances derived from the bacterial body which are capable of splitting these up into fragments.

Dr. F. W. TWORT (London) detailed his experiments upon a similar phenomenon first observed in certain colonies of micrococci developing in cultures from vaccine-lymph. Certain of these growths underwent a glassy transformation, and films from the altered areas showed the cocci to be broken up and altered in appearance. The condition was infectious and transferable from colony to colony. The active principle causing the change is filtrable, and retains its activity for many months. Heating to 60° C. causes its destruction. These results, obtained more especially with the cocci mentioned, are also applicable to other organisms, and it is considered that the phenomenon is essentially identical with that described by d'Herelle. Dr. Twort originally believed the change produced in the organisms to be due to a living ultra-microscopic virus, possibly vaccinal virus, but at a later stage modified his ideas, and now inclines to the view that the phenomenon is more probably due to the setting free of a lytic enzyme by the destruction of the organisms. He did not think that the differences in thermo-resistance noted between his lytic agent and that of d'Herelle constituted any real objection to their identity, other factors, which were not excluded, influencing the death-point of the active substance.

Dr. ANDRÉ GRATIA (Brussels) associated himself with Bordet's view that the lytic principle is derived from the organisms, and results from an hereditarily transmissible modification. He considered the phenomena described by Twort and by d'Herelle to be identical. The possibility of transmission in series was not proof of the living state, since a like phenomenon is possible with dead products—e.g., the coagulation of plasma may be carried on in series after the initial introduction of thrombin. The changes concerned in a reaction might liberate products capable of initiating the reaction in series. A bacterial culture is not to be considered as a homogeneous whole, but as a population of individuals having individual differences; certain of these might be abnormally sensitive to lysis, and by being attacked by a lysin too weak to act on the mass of a culture might give rise to those areas of dissolution in a surface growth which have been described by d'Herelle as colonies of the bacteriophage. The phenomenon is one of living cultures, and this fact supports the view that the lytic agent is a product of the bacteria themselves.

Prof. J. C. G. LEDINGHAM (London) said that the discussion, in his opinion, reopened an old field rather than brought forward a new one. Most of the work done upon this subject was diverted towards finding a theory satisfactorily explaining the facts rather than to the elucidation of the conditions governing the phenomenon. Accurate quantitative work was necessary for the better understanding of these facts. Certain broad lines of agreement emerged from the mass of material brought forward. Certain types of organism seemed to undergo lysis which might be started in a variety of ways, and once commenced was transmissible in series. In cultures submitted to this process certain individuals were naturally resistant, whilst others were naturally susceptible. The growth curve of susceptible strains was not of the normal type, but after a phase of multiplication a sudden drop might occur on account of the intervention of the lytic phenomenon. The serial transmission of the lytic principle is explicable upon the assumption that the solution of the organism frees lytic substances from their protoplasm. Lytic substances appear in the serum of animals within a few hours after the introduction of bacteria into the peritoneum, and it is believed that this constitutes a link between the experimental results of d'Herelle and the therapeutic effects of certain sera. The main factors requiring consideration in this work are the variability of bacteria in their susceptibility to lysis and the destructive action of bacterial protein, in a colloidal or finely divided state, upon such susceptible strains.

Dr. J. W. MCLEOD (Leeds) commented upon the fact that appearances similar to some of those described by previous speakers might be produced by auto-inhibition. Where thin layers of agar were super-

imposed upon growing colonies, substances diffused from these latter and prevented the obtaining of fresh surface growths upon the superimposed agar. The substances causing this inhibition were probably varied, but in certain cases they were simple inorganic products, hydrogen peroxide being the active substance in the case of the pneumococci and certain streptococci. He believed that autolytic enzymes normally present in the bacterial body were freed in the d'Herelle phenomenon, and that the initiation of this phenomenon depended upon the selection of a method of destroying the bacteria which caused their death, but did not injure these special enzymes.

Dr. A. FLEMING (London) said that the most important feature of these bacteriolytic phenomena was their apparent increase during activity. He had isolated a series of similar substances from a great variety of sources—e.g., egg-white, tears, vegetable juices, &c.—which had a very remarkable lytic effect and were able to destroy thick emulsions of bacteria, which was not the case with the lytic substances described by d'Herelle. These substances, which he designated lysozymes, produced almost immediate solution of the organisms, and acted alike on living and dead bacteria. They were not transmissible in series. He did not consider these substances identical with the bacteriophage, although it was likely that all bacteriolytic bodies of this type were similar.

Dr. A. W. M. ELLIS (London) agreed with the views expressed by Dr. Gratia and Dr. Ledingham as to the probability of the lysins being derived from the bacterial body. He considered that the known ferments of the bacterial cytoplasm were in some way activated, and that this sufficed to explain the phenomenon. He had studied the effect of various agencies upon the phenomenon, and found that a temperature of about 37° C. was an optimum. Reaction was important, a hydrogen-ion concentration of pH 8 giving the best results. Zone reactions were observable in this phenomenon, as in many other biological processes. He had repeated some of d'Herelle's experiments on the importance of these bodies as defensive agents in animal intestinal diseases and had found that they conveyed no protection whatever.

Prof. DAVID ELLIS (Glasgow) said that it was important to study the process in the individual bacteria. In certain large sulphur-containing bacteria undergoing degenerative changes the bacterial body splits up into compartments and then undergoes lysis. In this case the lysis is a phenomenon of degeneration, and is probably due to osmotic changes in the dying cell. He believed that the same general principle would be found to underlie all these allied phenomena.

Dr. TWORT, replying, said that the phenomena were best observed in young growing cultures having abundant nourishment, and therefore could not be looked upon as a degenerative change. The diversity of results obtained by different workers was probably explicable on the grounds that results would naturally vary with the employment of different types of organisms and the lack of exactly similar conditions of working.

Dr. D'HERELLE, replying, said that the facts brought forward by Dr. Fleming were the strongest arguments adduced in favour of the living nature of the bacteriophage. The phenomena described by Fleming were not transmissible in series, and therefore not due to a living organism; the converse holds good for the bacteriophagic phenomena. He reiterated his opinion that the phenomenon described by Twort was not identical with that associated with his name, although closely allied.

Dr. R. CECIL ROBERTSON (Glasgow) read a paper on the Toxin of *B. dysenteriæ* Shiga. He pointed out the difficulties met with in preparing a non-toxic vaccine of Shiga's bacillus. The methods of Thompson or Dean were not satisfactory for this purpose. After attempting the solution of the bacteria in caustic soda without success, he had recently used the method of suspending thick emulsions of the bacteria in strong ammonia, and, after incubation, of neutralising with 20 per cent. sulphuric acid. A precipitate results in which the bacterial bodies are still countable, but they are non-toxic and retain their antigenic efficiency for the production of active immunity on inoculation. These altered organisms had served to immunise animals against 20 lethal doses of the virulent bacilli.

THURSDAY, JULY 27TH.

At the second meeting of the section, held in the Zoology Department of the University, Sir WILLIAM LEISHMAN took the chair. Dr. MERVYN H. GORDON (London) opened a discussion on the

Bacteriology of Influenza.

Dr. Gordon said that interest in the ætiology of the disease had been especially awakened by the pandemic of 1918–19. Since influenza was clinically such an ill-defined entity it was desirable to study all forms of catarrh of the respiratory tract, including measles, along with this disease. The methods employed should include, besides the ordinary routine film and bacteriological ones, the cultivation of the filtered secretions by the Noguchi method. Recent work upon coryza had produced evidence that micro-organisms occurred in the acute phase which were small enough to traverse these filters and were capable of cultivation by the Noguchi method. The difficulty of dealing with these minute organisms is great on account of their small size, and the consequent difficulty in efficiently staining and demonstrating them; for example, the globoid bodies, described by Flexner and Noguchi in poliomyelitis, are only from 0·1–0·3 of a micron in diameter, and prolonged staining and the use of special fixing and mordanting agents is necessary for the successful demonstration of all of this class of bodies. Following experiments by Kruse in 1914, and especially supported by experiments of Foster, in the American Army, the view has been gradually growing up that the common cold is due to a filtrable virus, which Foster claims to have cultivated upon Noguchi medium. Turning to influenza, the speaker commented upon the failures which have resulted from attempts to infect volunteers with Pfeiffer's bacillus, and although Cecil and Blake had succeeded with monkeys, using cultures of high virulence, Cecil and Steffen, who had made similar experiments with human volunteers, had not succeeded in producing typical influenza although a coryzal condition had resulted. There is considerable evidence, on the experimental side, that in influenza the primarily infecting agent is a filter passer. Yamanouchi and his colleagues produced influenza by means of the filtered nasal secretions and blood of patients suffering from the disease, but failed to infect persons who had recently recovered from influenza. Animal experiments to define the primary infecting agent are liable to be unconvincing, for it is the secondary lesions which cause the fatal issue in this disease. Since the inconclusive data put forward by workers in the British army in favour of the presence of a filtrable virus in influenza, Olitsky and Gates, in America, have published observations confirming and extending these earlier results. The essential of their work has been to show that a constant syndrome, consisting of fever, leucopenia, involving especially the lymphocytes, and pulmonary lesions consisting of hæmorrhage, œdema, and emphysema, result from the intratracheal injection into rabbits of the filtered secretions from influenza patients. Using this result as an index of the presence of the infecting agent they have studied various of its properties and succeeded in cultivating it in Noguchi medium. In later papers they state that, after prolonged cultivation in this medium, they have succeeded in growing the organism on ordinary blood agar under anaerobic conditions.

The speaker's personal observations were made at St. Bartholomew's Hospital, at the end of 1921 and the beginning of 1922, in an epidemic affecting the nurses at that institution. The diluted naso-pharyngeal washings were filtered through Berkefeld candles and inoculated into tubes of Noguchi medium, which in four to six days developed a cloudiness in cases in which the culture was positive; control and negative tubes

remained clear. Material taken from the clouded portions of the culture tubes, and suitably stained, showed great numbers of minute rounded bodies strikingly resembling those figured by Paschen in vaccine lymph. The investigation of these bodies is beset with very great technical difficulties, one of the chief of which is the lack of a reliable and simple method of staining. In Dr. Gordon's hands the methyl-blue of Grübler has given the best results. Summarising his results the speaker mentioned that he had obtained positive cultures in 14 out of 20 cases of influenza examined within 36 hours of onset of the disease. Seven cases of measles would appear to have yielded two positive results. The small bodies found in the cultures had also been demonstrated in stained films of the nasal secretions at the onset of an attack of influenza.

The speaker considered that the time was not yet ripe for giving a specific name to the organism described, and thought that that of *Bacterium pneumosintes*, put forward by Olitsky and Gates, was premature. He believed that influenza was due to a filter-passing organism, and thought the importance of other organisms, amongst them Pfeiffer's bacillus, was in relationship to the severity of the attack.

Prof. J. MCINTOSH (London) spoke especially of his work during the 1918–19 epidemic. The very diverse reports upon the incidence of *B. influenzæ* in this disease were partially explicable by the lack of exact knowledge as to the most favourable methods of recovering this organism from the secretions, which was an almost universal drawback in the earlier stages of the epidemic and was not removed until the rediscovery of the very favourable action which blood derivatives had for this purpose. In his opinion the incidence of *B. influenzæ*, when due allowance is made for this consideration, in the epidemic in question was sufficiently high to fulfil the first of Koch's postulates. The further evidence for the relationship of the organism to the disease was only to be gained by the survey of various aspects of the problem. The most striking experiments were those of Cecil and Blake, who had used a strain of *B. pfeiffer* of high virulence, and by instillation into the nose and throats of monkeys had produced a coryzal disease which in some instances became complicated by broncho-pneumonia and from the lesions of which the same bacillus was recoverable. Patients recovering from influenza showed in their blood antibodies, demonstrable by the complement-fixation test, towards *B. influenzæ*. The chief and most characteristic pathological lesion in human cases is an acute tracheitis, or tracheo-bronchitis, with engorgement of the mucosa and sometimes a muco-purulent exudate thereon. In the lungs congestion, hæmorrhage, bronchitis, peribronchitis, and broncho-pneumonia were characteristic features of the severe cases. Bacteria swarmed in the mucous exudate of the bronchial tubes and often small Gram-negative bacilli were to be seen. In the early lung changes bacteria were rare, and the histological changes consisted in the exudation of œdema fluid, and hæmorrhage; it is only in the later stages that bacteria become prominent in the lungs. Parker had recently shown the conditions under which the toxic products of *B. influenzæ* could be best obtained, and it had been found that this toxin was thermo-labile and capable of neutralisation by an antitoxin; though the neutralisation of multiple doses had not been successfully carried out on account of the comparatively dilute condition in which the toxin was obtained and the unworkable bulk of the material required to carry out these experiments. The toxin, when injected into animals, produced an immediate illness associated with fall of temperature and collapse, and in such animals petechial hæmorrhages were common. In the lungs œdema and emphysema occurred, with areas of typical broncho-pneumonia, proliferative changes in the bronchial and alveolar epithelium and small hæmorrhages. In interpreting hæmorrhagic lesions, whether claimed to be produced by a filterable organism or not, it must be remembered that these were very easily produced, and sometimes their presence depended upon the way in which the animal had been killed. The speaker's own experiments upon a filterable virus in influenza had been negative, and it was to be remembered that there were possibly many of these present in the throat and mouth, as, for example, the herpetic and encephalitic viruses studied by Levaditi and found by him in the mouths of healthy persons.

Dr. J. HENRY DIBLE (Manchester) said that the initial problem which confronted those working at the ætiology of this disease was the lack of any criterion for defining it. There were two distinct conditions met with in the recent epidemic: one was the mild "three-day fever," characterised by catarrh, pyrexia, and prostration, which was practically invariably recovered from; whilst the other was the very fatal disease, seen in the later periods of the epidemic, characterised especially by the broncho-pneumonic lesions to which the high mortality was due. Accepting the present-day view that these latter were secondary events, occasioned by the invasion of damaged lungs by pneumococci and hæmolytic streptococci, we were driven back upon the position that only the first of the two clinical conditions described was pure influenza, and that it was therefore towards this type of the disease that we must especially divert our attention and endeavour to reproduce by our experiments. Pneumonic lesions were no essential of influenza. The sole criterion which had gained favour as evidence of the pure influenzal infection during life was the leucopenia, with especially marked fall in lymphocytes, which Dr. Gordon had mentioned and which Olitsky and Gates accepted as evidence of such an infection. What was the response of the organism to Pfeiffer's bacillus? It was first necessary to define this bacillus as exactly as possible. In the examination of the throats of a hundred healthy medical students for Pfeiffer's bacilli the speaker had found hæmophilic bacteria in 48 per cent. Not all of these, however, were Pfeiffer's bacillus. The organisms found were divisible into two main groups, one of which, found to be represented in 17 individuals, consisted of organisms not in the Pfeiffer group at all. These organisms were often distinguishable from Pfeiffer's bacillus by their large size, greater saccharolytic ability, and the fact that many of them produced hæmolysis and none of them indol. The Pfeiffer group were less active in sugar-splitting, non-hæmolytic, and, in about a half of the stains examined, capable of producing indol. The resemblance of the two groups was sometimes very marked, and it was possible that, if care were not taken, an organism of the group considered by the speaker not to be the Pfeiffer group might be used in experiments instead of one of the latter. Reverting to his own work upon the cellular response in Pfeiffer infections the speaker showed slides to illustrate the fact that in infection by the bacillus itself, introduced into the blood stream, the result was a leucocytosis chiefly affecting the polymorph cells. This condition was not that which pertained in disease, in which the organisms did not invade the blood or tissues to any appreciable extent. The introduction of the toxins of the organism, prepared after Parker's method, more closely simulated this, and in these cases the constantly produced result, in rabbits, was a pronounced leucopenia, due to a depression of the lymphocytes, which set in rapidly and corresponded to the period of collapse which occurred under the influence of this toxin. In the light of the work of Dr. McIntosh, and especially of that of Blake and Cecil, Dr. Dible said that one was driven to the conclusion that the bacillus of Pfeiffer, and its toxins, *could* produce the whole of the conditions associated with clinical influenza. There was, then, the question of the filter-passer. The amount of work and evidence which was steadily accumulating necessitated a most careful examination of the whole question. Criticism was easy, since the technical difficulties were so great, but for this very reason it ought not to be made too lightly. Certain criticisms however, had to be made. In the first place filtration was an extremely crude procedure. A filter was a

series of holes, and what went through depended upon the relationship of the largest hole in the filter to the smallest bit of viable bacterial protoplasm in the substance being filtered and to chance. It was necessary to state the exact conditions of filtration in all experiments and the time and pressure used during filtration. Berkefeld filters were, in his hands, not very reliable. It was desirable to improve these methods and, if possible, to adopt some standard technique. Further, he was surprised by the relatively enormous amounts of injection Oblitsky and Gates used, even with their cultures, to produce lesions; their virus was non-pathogenic for monkeys, whilst Gibson, Bowman, and Connor claimed to have produced the disease in monkeys. The totality of the results was, however, too great to be set aside by criticism, and the only way by which the problem would be solved was by working at it.

The CHAIRMAN said that during the winter of 1921–22 he had received reports from a large number of army laboratories which had had instructions to look for Pfeiffer's bacillus in various epidemic centres. These reports had shown an extraordinary diversity of opinion as to its incidence in the disease. Inoculation with a vaccine of Pfeiffer's bacillus seemed to diminish definitely the complication and death-rates.

Prof. LEDINGHAM said that the greatest difficulty in investigating this disease appeared to be the lack of any animal, other than man, which was really susceptible to the causal agent. In India, in the early stages of the 1918–19 pandemic, he had failed to find Pfeiffer's bacillus, and he did not believe that Dr. McIntosh's criticism that such failures were due to incorrect technique was entirely applicable. He commented upon the resemblance between the small bodies shown in Dr. Gordon's micro-photographs and the rickettsia bodies of typhus; on the whole, he believed the filter-passer theory to be the correct one.

Dr. TWORT emphasised the necessity for standardising methods of filtration already alluded to. It was remarkable, he said, that whilst so many filter-passing viruses had been described, no one had yet succeeded in cultivating a saprophytic example of organisms of this variety.

Dr. FLEMING alluded to the variety of organisms found in the common cold, and believed that the bacteria described in these were saprophytes. He thought that Pfeiffer's bacillus was of definite importance in influenza in relationship to its complications.

Dr. R. M. BUCHANAN said that there were many types of the disease. He alluded to the possibility of the pneumonic type arising by the coincident spread of the viruses of the two diseases. In many cases of influenza the growth on plates, obtained from the droplets coughed out by patients, were of *B. influenzæ*, pneumococcus, and streptococcus, simultaneously. It was possible that the changed form of the disease at the latter period of the epidemic might be due to the dissemination of the last two organisms along with the active agent of influenza. Whatever might be its rôle, as an originator of the disease, Pfeiffer's bacillus was important in its evolution.

Dr. GORDON, replying, admitted the importance of Pfeiffer's bacillus, and the possibility of its producing lesions akin to those of influenza. The case for the filter-passing organisms was not yet proven, but evidence to this end was accumulating. All his filtration was carried out on Berkefeld filters, under pressure of from 10–12 cm. of mercury, and the time occupied in the process was never more than a quarter of an hour. He thought filtration might be replaced by finding a selective antiseptic to kill the banal organisms whilst sparing the filter-passer. He had confined himself to bringing forward the fact that it was possible constantly to demonstrate the presence of a viable filter-passing organism in cases of influenza, and he did not at the moment attempt to prove its ætiological rôle in this condition. This, he believed, could only be done by experiments on the human subject.

Prof. MCINTOSH, replying, stated that typical influenza had been produced in human subjects by the vaccine used for preventive inoculation.

The CHAIRMAN, in closing the discussion, said that the matter was still a big unsolved problem. We were only at the beginning of our knowledge of the class of filtrable viruses. He agreed with Dr. Dible's remarks about the unsatisfactoriness of our methods in dealing with these, and it might be of interest to the meeting to know that the Medical Research Council was organising a team of workers to attack the problem from the physical, bacteriological, and clinical sides. It was proposed to work especially upon the viruses of chicken sarcoma and dog distemper, and it was hoped that improved methods would enable many of the difficulties in this type of work to be surmounted.

SECTION OF ANÆSTHETICS.

WEDNESDAY, JULY 26TH.

THIS section, over which Dr. W. J. MCCARDIE (Birmingham) presided, was well attended by anæsthetists from all parts of Great Britain. The President in his opening remarks commented on the fact that the training of medical students in administering anæsthetics was still in the hands of surgeons, a practice which he described as obsolete and not in the best interest of patient or student. The surgeon engrossed in his own work could have neither time nor inclination to keep abreast of the ever-advancing developments in anæsthesia.

A discussion on

Broncho-Pulmonary Complications Following Anæsthesia.

was then opened by Dr. DAVID LAMB (Glasgow), who remarked that, whilst all Glasgow anæsthetists used ether freely as well as chloroform in their work the students were still taught that, whilst a few deaths occurred on the table from chloroform, far more occurred after the operation from pulmonary troubles and heart failure when ether was used. The number of fatalities occurring annually in Glasgow from chloroform in the hands of comparatively inexperienced anæsthetists would probably surprise the adherents of this old doctrine.

Frequency.—Statistics could be of little value unless they were based upon careful personal observation of all cases and unless they discriminated, first between clean and septic cases, and secondly between those beginning in the 24 or 48 hours after operation and those occurring later on. The latter were almost always associated with sepsis. The true nature of abortive pneumonias—due in 70 per cent. of cases to pneumococcus group IV.—had been shown by means of radiography at the Presbyterian Hospital, New York. In other pneumonias after operation the exciting organisms included groups I., II., and III. of pneumococcus, the influenza bacillus, a streptococcus, and *B. capsulatus*, Whipple.

Causation.—The most important contributory factor in the causation of broncho-pulmonary complication was the presence of recent catarrhal affections of the upper air passages of the patient prior to the operation. Next in importance was exposure to chill before, during, or after operation, though aspiration of infective organisms contributed. With regard to the part played by the anæsthetic opinion in this country and abroad varied, but the general consensus was that only prolonged administration, more especially of concentrated vapour of ether, gave rise, by direct irritation or by chilling due to evaporation, to any real danger. Dr. Lamb himself held that the vapour of ether, and of chloroform to a much less degree, was certainly an irritant to the lining membrane upper air passages but rarely sufficiently—unless unskilfully administered—to set up a purely irritant bronchitis or broncho-pneumonia, akin to that caused by poison gases during the war. But where there was any weakening of tissue

resistance due to congestion from chill or to the presence of mild catarrh or to a combination of these, a comparatively mild irritation action, more especially by ether, might lead to overwhelming of the natural antibodies. Pleurisy, empyema, and abscess of lung, as well as pulmonary embolism and infarction, also had to be considered.

Prevention.—Dr. Lamb advocated the employment of expert anæsthetists who would avoid the use of too concentrated a vapour and the administration of ether in unsuitable cases. He advised a preliminary injection of atropine, the lateral position of the head whenever possible after operation, especially in mouth cases to prevent aspiration, avoidance of tight bandaging in heart and abdominal cases, lavage of the stomach prior to operations for the relief of obstruction. He concluded by suggesting the circulation before the next meeting of a questionnaire, aiming at well-directed personal observation by a number of anæsthetists over a period of six months.

Dr. F. M. DICKINSON BERRY (London) believed that so-called ether-bronchitis was somewhat of a myth. In order to prove its existence all possibilities of sepsis, chill, or other infection must be first eliminated, and personally she could recall no case of chest trouble directly attributable to the anæsthetic. She analysed a series of 1411 cases of thyroidectomy operated upon by Mr. James Berry during the past 34 years, in which ether, chloroform, mixtures of these and local anæsthetics had been used at different times. Carefully kept notes revealed that only in six cases were lung or throat troubles mentioned. In the first two of these the anæsthetic was chloroform, in the third case a local anæsthetic was given, in the fourth chloroform followed by ether. In the last two cases there was evidence of infection before operation, the anæsthetic in each case being open ether; while in the last case the ether seemed to have a beneficial effect inasmuch as râles which had been found scattered all over the chest rapidly cleared up after the anæsthetic had been given. She was of opinion that while the anæsthetic could only rarely be the primary cause of such complications, it might probably be a contributory factor. Chloroform owing to its depressing effects was likely to be more deleterious than ether, while severe operations under local anæsthesia might conceivably lead to greater depression than would follow a general anæsthetic.

Dr. A. L. FLEMMING (Bristol) criticised the use of strong solutions of cocaine in laryngeal surgery. There was increased risk of aspiration of septic matter when the laryngeal reflex was abolished. The anæsthetist should be consulted in cases where complications occurred, as such cases were frequently aggravated by the injudicious use of strong expectorants.

Dr. J. P. BOYD (Glasgow) called attention to the frequency of complications in high abdominal operations. Chloroform would not help the "chesty" individual. There was a tendency for complications to occur in runs, and in such cases an explanation must be sought in outside conditions—e.g., draughty corridors, catarrhal epidemics, &c.

Mr. H. J. PATERSON (London), speaking as a surgeon, said that anyone using chloroform without sufficient reason should be criminally prosecuted. He strongly advocated gas and oxygen for abdominal operations even at the expense of discomfort to the surgeon from rigidity. No operations other than emergencies should be performed in cities. Hospitals should be built in the open country. He insisted on the value of deep breathing both prior to and after operation, as tending to minimise complications.

Dr. H. W. FEATHERSTONE (Birmingham), from an analysis of 313 consecutive medical and surgical post-mortem examinations made at the Birmingham General Hospital, had formed the conclusion that pneumonia was a frequent terminal condition, and one more common in severe post-operative conditions than in serious non-operative or medical cases. The affection seemed to have an affinity for the lower lobes of the lungs, while the incidence of pneumonia was more marked after chloroform than after ether. In all cases at least one of the five sources of shock were present—namely, septicæmia, embolism, upper abdominal operation, severe general peritoneal shock, and aspiration of septic material from nose and throat. He concluded that ether, even when given cold and in great concentration, played but little part in the causation of broncho-pneumonia. This condition was to be expected in the surgical abdominal wards, and it was there that it was found. All that was necessary to ensure a broncho-pneumonia was a suitable infective organism, readily available at certain seasons and in certain surroundings.

A communication from Dr. J. S. ROSS (Edinburgh) was read, in which he analysed 484 cases seen in the first year of war service. He found 21 cases of pulmonary complication with a morbidity-rate of 4·3 per cent.; 10 had received chloroform, 7 ether, and 4 a mixture. Three cases of lobar pneumonia occurred, of which one was fatal. In this case a mixture of chloroform and ether was given. Warmed vapours appeared to be of benefit though they would not entirely prevent complications. He believed that the frequency of post-operative complications was largely due to the prevalence of naso-pharyngeal catarrh, and that had efforts been made to clear up this condition before operation, an appreciable improvement in the morbidity-rate would have been noticed.

Dr. K. B. PINSON (Manchester) analysed a series of 4180 cases and found a morbidity-rate of 1·34 per cent., of which the proportion of pneumonia to other complications was as 3 to 4. He was strongly adverse to methods involving rebreathing on the part of the patient or causing deep breathing, as tending to exhaustion and the lowering of resistance.

Dr. H. PINTO-LEITE (London) emphasised the danger of complications ensuing from neglected oral sepsis, especially of dental origin. The dentist should be called in before operation and not afterwards, as was so often the case. He mentioned a case, which occurred in his practice, of a death some six hours after rectal administration of oil ether, and in view of the rapidity of its occurrence attributed this to cardiac failure rather than to pulmonary congestion, in the absence of a post-mortem examination which could not be secured.

Dr. H. P. FAIRLIE (Glasgow) commented on this last conclusion, and considered that the rapid onset of serious symptoms and of death in this case did not rule out œdema of the lungs. He quoted a case of intravenous ether administration to a lad of 15 for a hernia operation, within an hour of which he was called in to see the patient who was gravely ill with all the symptoms of œdema of the lungs. After lasting for 4–5 hours the condition cleared up in response to free bleeding and continuous administration of oxygen.

Dr. ADAMS (Birmingham), speaking as a member of the house staff of a general hospital, drew attention to a condition simulating lobar pneumonia, but really due to lung collapse. He had seen three cases in which the condition had definitely been established, and in the light of his present knowledge suspected that his was really the condition present in three previous cases. Such cases must be examined early both clinically and with the X ray or the diagnosis would remain doubtful. He also pleaded for the extended use of atropine after operation in cases where "chesty" conditions were present.

Dr. W. BARRAS (Glasgow) submitted a series of 1081 anæsthesias in which the subjects were all adult males who had served in the army. The morbidity-rate for pulmonary complications was 3·7 per cent., made up of bronchitis 3·3 per cent., pleurisy 0·2 per cent., pneumonia 0·2 per cent. The greatest incidence of complications was in the group of cases operated on for abdominal conditions. In view of the gross sepsis present in most of these cases the morbidity-rate was surprisingly low. He believed that the mechanical irritation of the vapours of chloroform and ether had little to do with the ætiology of post-anæsthetic complications, though these drugs, by diminishing the

opsonic power of the blood and its phagocytic action, favoured the development of broncho-pulmonary conditions.

The PRESIDENT concluded with a review of the morning meeting, and invited the members of the section to luncheon in the club-room of the University Union.

In the afternoon an informal meeting was held, at which Dr. Flemming read a paper on the different effects produced by exposing tissues to various concentrations of anæsthetic vapour, illustrating his text by drawings, photographs, microscopic slides, &c. Dr. Binson then demonstrated his bomb apparatus for the administration of ether, and Dr. Featherstone his improved airway.

Reports and Analytical Records.

COLLOSOL ARGENTUM.

(THE CROOKES LABORATORIES, CHENIES-STREET, LONDON, W.C. 1.)

A LITTLE brochure of 31 pages, issued to the medical profession only, contains a plain statement of the facts relating to the actions and uses of collosol argentum. As against other antiseptics, it is claimed for this preparation that it does not injure the tissues nor interfere with the phagocytic power of the leucocytes, and that, unlike silver nitrate, it produces no staining. Clinical evidence is adduced in favour of an actual acceleration of healing produced by the preparation. Collosol argentum is stable, if protected against decomposition, and its keeping properties obviate too frequent redressing of an infected area. According to Mr. J. E. R. McDonagh's oxidation hypothesis, its antiseptic powers may be enhanced by contact with living tissues. Ophthalmic surgeons especially have availed themselves of this form of application of silver to the conjunctiva. A county medical officer of health provides midwives with a supply for the avoidance of ophthalmia neonatorum, with evidence of good results. It is claimed that it may with safety be placed in the hands of midwives and nurses for use as a prophylactic against ophthalmia, in which it is painless and non-irritant. Collosol argentum is put up in the form of solutions, bougies, pessaries, and suppositories, varying in strength from 1 in 2000 to 1 in 400.

MEAD'S DEXTRI-MALTOSE.

(MEAD, JOHNSON AND CO., 6, NORTHUMBERLAND-AVENUE, LONDON, W.C. 2.)

Ordinary malt extract contains 48–70 per cent. of maltose and 2–16 per cent. of dextrin, along with some diastase and salts of lactic and phosphoric acid, and 20–25 per cent. of water. Mead's dextri-maltose is standardised to consist of 51 per cent. of maltose, 42 per cent. of dextrin, with 5 per cent. of water, and at choice salt free, sodium chloride 2 per cent. or potassium bicarbonate 3 per cent. The result is a powder, which contains no cellulose and is wholly soluble in water. Maltose was found by Reuss to be assimilated by the animal body to the extent of 7·7 g. per kg. of weight. Dextri-maltose has a food value of about 110 calories per ounce and can be administered to supply the necessary carbohydrate for artificially fed infants with little risk of digestive upset. No. 1 (NaCl, 2 per cent.) is provided for general use in infant feeding; No. 3 ($KHCO_3$, 3 per cent.) for the use of infants who suffer from constipation, the alkali ensuring a soft flaky curd similar to that of human milk; No. 2 (salt free) for use by practitioners who prefer to make their own salt additions to feeding mixtures. Each form is put up in air-tight containers of 1 lb. or 5 lb. These convenient forms of maltose are advertised only to the medical profession and no feeding directions accompany the trade packages. Information regarding their use reaches the mother solely through the prescribing doctor.

GEORGE ROE'S PURE POT-STILL (THREE STARS) IRISH WHISKY.

(BOTTLED BY THE DUBLIN DISTILLERS AND CO., LTD., 157, THOMAS-STREET, DUBLIN.)

This whisky, which is guaranteed to be seven years old, on analysis showed the following figures:—

Alcohol, proof spirit percentage	70·87
,, equivalent to ..	29·13 per cent. under proof.
,, by volume	40·5 per cent.
Total solids	0·11 gramme per 100 c.cm.
Organic extractives	0·10 ,, ,, ,,
Mineral matter	0·005 ,, ,, ,,

	Mgms. per 100 c.cm. of absolute alcohol.
Total acidity as acetic	25·0
Volatile acid as acetic	12·5
Esters as ethyl acetate	20·0
Furfural	8·2
Aldehyde	42·5

The analytical results point to this whisky being a sound, well-matured product. The flavour and aroma are characteristic of a good Irish whisky. The furfural content is somewhat high, while the other constituents are normal in amount. It can be recommended to consumers of Irish whisky as a palatable and wholesome spirit.

SIL-AL.

(STICKLAND AND CO., 23, CROMWELL-PLACE, SOUTH KENSINGTON, S.W. 7.)

This is a silicate of aluminium in the form of a white inodorous tasteless powder. Mixed with water it remains in suspension ensuring even distribution in the stomach. Its composition and physical characteristics correspond with those of bolus alba, whose useful absorbent powers are well known. The recommended dosage is 5 grammes in half a tumbler of water half an hour before meals three times daily, this being a distinctly higher dose than that recommended for kaolin when that powder is being employed internally for its absorbent or emollient properties.

A PATHOLOGICAL BOOT-TREE.

(HORNE BROS., 90 AND 92, OXFORD-STREET, LONDON, W.)

We have received from Messrs. Horne Bros. examples of a new boot-tree which they are putting on the market, and find the idea, which is a very simple one, ingenious and useful. The tree is perforated on its surface at intervals of about half an inch, and studs are supplied which will fit into the holes. Thus if a boot presses annoyingly over any prominence, joint, or surface of the foot the stud can be placed at the spot on the tree and the boot thoroughly stretched at that spot. In the case of deformity larger or appropriately shaped studs could be devised, in order to keep expanded the eccentricities of any special boot, while for the ordinary local tendernesses caused by corns, or by a not perfectly fitting boot, the trees will prove useful. The trees are well made in white metal or in wood.

ITALIAN LABOUR LEGISLATION.—A notable advance has been made in Italian social legislation, the Italian Senate and Chamber of Deputies having just adopted Bills for the ratification of the draft conventions of the International Labour Conference of the League of Nations relating to the following subjects: employment of women before and after childbirth; employment of women during the night; night work of young persons employed in industry, and unemployment. This will involve considerable change in existing Italian labour legislation; for example, the compulsory period of rest before childbirth will be increased from three to six weeks, and grants for six weeks before and six weeks after childbirth, with free medical attendance, will be provided. It will be recalled that Great Britain has ratified the conventions concerning unemployment, and night work of women and young persons.

THE LANCET.

LONDON: SATURDAY, SEPT. 2, 1922.

The Apparent End of the Drought.

AT intervals since August of last year we have dealt with considerations arising out of the drought. The present position, as judged by the records of the British Rainfall Organisation at Camden-square, is as follows:—

Month.	Mean temperature degrees F.			Rainfall in inches.			Duration of sunshine in hours.	
	1921	1922	Aver. 1860–1919	1921	1922	Aver. 1881–1915	1921	1922
January ..	46·0	40·1	38·7	2·48	2·81	1·86	20·0	70·7
February ..	40·7	41·0	39·9	0·18	2·20	1·67	46·8	55·5
March	46·8	41·8	42·2	1·19	1·51	1·83	113·8	82·8
April	49·5	44·1	48·0	1·29	3·02	1·54	191·7	120·0
May	57·0	59·2	54·5	1·03	0·83	1·76	227·6	267·5
June	61·8	60·7	60·2	0·37	1·12	2·02	221·7	223·4
July	69·4	59·5	63·4	0·13	3·85	2·38	253·9	141·7
Total rainfall for seven months				6·67	15·34	13·06		

From which it will be noted that although the rainfall for 1922 compares so far very favourably with 1921, there is even yet a large deficiency to be made up, the present excess over the average being only 2·28 inches, whereas 6·39 inches are needed to correct last year's omissions to the end of July. Nevertheless, the copious rains of January, February, and April did do a lot of good, and the heavy rainfall in July, although largely absorbed by vegetation, was accompanied by a temperature practically 10° F. lower than last year and 112 hours less sunshine, so that the watering of gardens and lawns was not even dreamed of. Further, the rainfall in London seems to have been largely exceeded in most parts of the country, and from what we can learn the position generally has ceased to cause any real anxiety. Nevertheless, it should be remembered that it is the five-month period from October to February which really counts, from a waterworks point of view, and whilst we are not so unkind as to hope for wet weather during the rest of the fleeting holiday season, we venture to put up a prayer for a reasonable, if not abnormal, rainfall during the autumn and winter.

Now that the fear of scarcity has passed, there arises again the question of the purity of our water-supplies. It is satisfactory to note that during the 19 months ended July 31st, 1922, the health of the community has remained good. This is the more gratifying inasmuch as, apart from the drought, the period has been one of grave depression and financial stringency. Only two epidemics alleged to have been water-borne have come to our knowledge: an explosive epidemic of dysentery [1] which occurred in Ogmore Vale and caused 15 deaths among 700 cases; a drawn-out prevalence of typhoid [2] in and around Bolton-upon-Dearne in Yorkshire with 400 cases over a period of six months. These have their lessons, but we venture to think that the drought has left us better equipped for the future. In the first place, the Ministry of Health has initiated an exhaustive research into the water resources of the country and has not hesitated to avail itself of external help. Over and above this, many waterworks authorities have been forced to take cognisance of a wide variety of factors which previously had not invaded their horizon. An atmosphere of trust has been created between water authorities and consumers which never existed before to the same extent. A number of vexed water problems have been ventilated and the consumer has evinced a desire to play the part of a good citizen. At the time when water was most scarce a wave of interest in questions of quality was everywhere apparent. Some of the questions which then came to the fore were those of waste water, compensation water, rural water-supplies, pooling of water interests, central control, rights as regards underground water, standard rates of domestic consumption, adequacy of future reserves, utilisation of abandoned sources of water-supply. The means of bringing the State, water and sanitary authorities, and consumers into closer relationship were discussed, along with the necessity of remembering that health interests are not necessarily antagonistic to a wise economy.

Although our first concern is to uphold the doctrine that an initially pure source of water-supply is fundamentally sound, it is impossible to ignore other considerations. While, in fact, or owing to economical stress, our sources of pure water are limited, our knowledge of the purification of doubtful water has fortunately increased within recent years. Chlorination in particular has come prominently to the front. Practised by HOUSTON in 1905 at Lincoln as an emergency measure, it was neglected in this country until the war laid bare its potential advantages. It looked at one time as if questions of flavour would destroy its usefulness. These difficulties now seem to have been largely, if not wholly, overcome. The concurrent use of permanganate has been attended with considerable success and, as may be seen from our brief summary of the annual report of the Metropolitan Water Board on p. 533, the bold exercise of super-chlorination and subsequent dechlorination processes has been shown to afford security against taste troubles. The process, no doubt, entails higher working expenses, but it also implies additional security, for the larger the dose of chlorine employed the more certain is the sterilisation process to be effective. This achievement has been the result of scientific control and has proved that it pays the community to place its operations of water purification in the hands of those possessed of special chemical, bacteriological, and epidemiological knowledge. Short cuts to purity of water are mere gambles.

[1] THE LANCET, 1922, i., 658.
[2] THE LANCET, July 8th, p. 86.

Work and Status of the M.A.B.

THE annual report of the Metropolitan Asylums Board on its work for the year ending May 31st, 1922, begins by setting out, as it well may, the scope of the Board's work. For however often the comprehensiveness of this scope is pointed out—and we have often called attention to it in these columns—the misleading title of the Board leads the public to forget that, pursuant to the provisions of the Metropolitan Poor Act of 1867, the Board combines the unions and parishes of the metropolis for the purpose of establishing "asylums" not only for the sick, insane, and infirm, but for other classes of the poor. As the French equivalent word, *asile*, still does, the word asylum at the time when the Act was framed included any institution for the shelter and support of afflicted or destitute persons. In carrying out their injunction the Board now administers 14 hospitals for infectious diseases admitting more than 40,000 cases in the year,

2 institutions for venereal diseases admitting 180 women, 7 institutions for tuberculosis admitting 3300 patients, 5 hospitals for imbeciles with a resident population of nearly 5500, besides 2 training colonies for the feeble-minded, a colony for sane epileptics, a training ship, 5 children's institutions, 8 casual wards, a land ambulance service, a river ambulance service with 3 wharves and 5 steamboats, not forgetting a bacteriological laboratory equipped for research.

The report on the year's work contains an interesting digest of the biggest epidemic of infectious disease with which London has ever been visited within the history of the Board, although by good fortune the mortality from scarlet fever, forming a large proportion of the cases, was but small. An institution recently purchased from the City of London Guardians provided 260 additional fever beds. The daily admissions of fever cases exceeded 150 on no fewer than 94 occasions, running up to 271 on one October day. Simultaneous prevalence of scarlet fever, diphtheria, and measles raised problems of great complexity and induced the Board to lay down the principle that in the acute hospitals about 25 per cent. of the total accommodation should be available for isolation purposes. Only two cases of small-pox were admitted during the year. Two wards comprising 150 beds were allotted, at the suggestion of the Ministry of Health, for the treatment of cases of influenzal pneumonia, and this provision proved sufficient. The King George V. Sanatorium at Milford near Godalming for 232 cases of pulmonary tuberculosis in adult males was only just ready for occupation at the end of the year. A little earlier St. Luke's Hospital at Lowestoft was made available for 150 adult patients of either sex suffering from surgical tuberculosis. The Children's Infirmary in Cleveland-street was given up during the year, the children being transferred to the sanatorium on the Surrey Downs near Sutton, now renamed the Downs Hospital for Children. At Queen Mary's Hospital, Carshalton, there is now accommodation for more than 800 children to undergo sunlight treatment on specially designed orthopædic carriages and frames. The treatment of tuberculous glands by a new applicator containing 15 mg. of radium bromide has met with gratifying success. A seaside home at Millfield near Littlehampton supplements the accommodation at Carshalton for those cases of surgical tuberculosis in children which require sea-bathing. These are only a few of the directions in which important work has been carried out under the Board's direction during the year. The medical staff suffered a lamentable loss during the year in the tragic death of the principal medical officer, Dr. H. E. CUFF. Departmental medical officers have now been appointed in the four principal branches of the service—viz., Dr. F. FOORD CAIGER (infectious hospitals), Dr. W. T. GORDON PUGH (children and surgical tubercle), Dr. J. WATT (medical tubercle), and Dr. E. B. SHERLOCK (mental hospitals).

A section of the report is occupied by a statement prepared for the Royal Commission on London Government. It will be remembered that two years ago a special committee of the London County Council on health administration suggested that in the interests of economy and central administration the institutions of the Metropolitan Asylums Board and its highly competent staff should be transferred en bloc to the Council. It was then pointed out that although the Council and the Board have always worked in friendly coöperation the Board is not appointed by direct election, and that while the Council determines the amount of accommodation which it asks the Board to provide, the Board makes this provision without control by the Council of the expenditure, the cost falling on the poor-rate. Expenditure is thus jointly determined by two bodies, neither of which is in the position to control it. The Board has now issued a closely reasoned statement which maintains that the proposed devolution is undesirable in itself, would be costly in working, and even if carried out would not make room for all the additional work which the Council proposes to undertake. The area proposed for Greater London cannot, in the opinion of the Board, be regarded as constituting a town for the purposes of local government. It would be much more like a province, requiring an entirely new form of local government to be devised for it. The Board counters with proposals that Metropolitan borough councils and the London County Council itself should be represented upon the Board, and that the mental hospitals now managed by the Council should be transferred to the control of the Board. As an alternative there is a further proposition for the setting up of a central Poor-law authority or of a board of public health. The time consumed by these inquiries will not, as the statement sagely remarks, be lost, as it will give an opportunity for what local authorities now most need—namely, a period of rest from legislative activities and from new remedies. It is generally admitted that the work of the Board is very efficient. The administrative work entailed in the management of the residential institutions and the arrangements for finance and supply at present occupies the time of the present Board of 73 members. The work indeed is so extensive that any member who wishes to do so can give his whole time to it, and many well-known men and women have actually done this. Should the radical proposals for administrative reform remain for a while on the table, this will give the existing Board time to deal with a number of pressing health problems

Botulism.

As our Scottish correspondent states, the Scottish Board of Health entertain no reasonable doubt that the eight deaths which recently occurred at the Loch Maree Hotel were due to botulism. The tragic outbreak has naturally directed attention to the possibility of further outbreaks in this country. First recognised in Germany, where it was at one time fairly prevalent, the nature of botulism was only elucidated when VAN ERMENGEM in 1896 isolated the *Bacillus botulinus* as the cause. From that date until about ten years ago the condition was looked upon as a very rare one and of academic rather than practical importance. Then a series of outbreaks and isolated cases were recorded in the United States of America and have continued up to the present time. They have shown two features of interest. In the first place, the European cases were nearly all associated with a vehicle which was usually meat in some form or other, and, indeed, the earlier outbreaks were given the title of sausage poisoning from the constant association with that form of made-up food. In the United States, on the contrary, the vehicle has been almost invariably fruit or vegetables in a preserved form, as a rule home canned or bottled, less commonly commercially put up in cans. One of the most dramatic outbreaks was after a banquet in a students' club house at San Francisco, when the noxa was a salad of string beans prepared at the home of one of the students. The other feature of interest is that the outbreaks have been mostly localised in California

or one of the western States. Since 1900 there have been reported 39 outbreaks of human botulism in California, with a total of 130 cases and a case mortality of 72 per cent. In the spring of 1918 a remarkable group of cases of oculo-motor paralysis, mostly occurring in London and Sheffield, was reported in our columns,[1] in which botulism was at first suspected to be the cause. Careful inquiry, however, showed that this diagnosis was unfounded. Dr. W. G. SAVAGE states definitely in his book [2] on food poisoning that he has been unable to trace a single definite outbreak of botulism in this country. The Loch Maree outbreak may be reasonably accepted as the first authenticated outbreak in Britain.

In California investigators have shown that the botuline bacillus is not only a cause of human disease, but that at least two animal diseases are related to it, viz., limberneck in chickens and fodder disease in horses. A diligent examination of possible material outside the animal body has demonstrated the presence of this bacillus upon the surface of growing fruits and vegetables, bruised cherries, decaying leaves, and the bodies of insects. Extensive soil studies have also been made, and it has been shown that the spores of the organism are widely distributed through the soil of the western States and also in many other parts of U.S.A. Dr. MEYER has published a map showing their distribution in soil, and at the present time has in hand a series of investigations, not yet completed, as to their distribution in England and other European countries. American investigators have also established the important point that there are two distinct types of toxin, distinguished by the letters A and B, and that the antitoxin of type A does not protect against the toxin of type B. Immune sera have been prepared, the most suitable animal being the goat, and the antitoxin so produced is valuable for treatment if the condition is recognised early enough. The occurrence of different types makes it necessary that polyvalent sera should be employed.

Concerning the possibility of outbreaks in this country the following facts have to be kept in mind. It is well known that the poisonous effects are due to the development of a powerful toxin by the bacillus, and that the spores of the bacilli themselves are harmless when taken by the mouth. The bacillus is a saprophytic anaerobe and produces its toxin outside the animal body. In the older outbreaks in Germany and other parts of the continent these conditions were provided by the stacking of bacon or other food under faulty conditions which restricted air access. In the more recent outbreaks the anaerobiosis is obtained in the sealed-up jars of fruit or vegetables. Exactly what were the conditions which caused infection and favoured toxin production in the Loch Maree outbreak must remain uncertain until after the results of the judicial inquiry. The possibility of outbreaks of botulism resulting from the enormous importation of canned fruits from California to this country has recently been discussed [3] by Dr. SAVAGE, His view is that the risk is a small one provided all unsound or doubtful food is rejected. The gist of his argument may be put thus. While direct examination and experimental investigation have shown that *B. botulinus* may be isolated from canned fruits or other foods which are perfectly sound in every way, the bacillus under such conditions is present in the sporing state and almost always in small numbers only. Such spores may develop into bacilli and produce extremely poisonous toxins under suitable conditions, but they will not do so in the animal body. Botuline spores in moderate number can be swallowed with impunity; danger only arises when the numbers are so large that the toxin in the spores themselves is sufficient to produce symptoms. On the other hand, if such spores find conditions suitable to their growth and develop, they will, it is true, produce potent toxins, but the process will be accompanied—usually but not invariably—by a physical alteration of the outside of the tin (blown or springy condition), and invariably by a rancid odour. In other words, the dangerous tins are also physically unfit, and in most, if not all, the recorded outbreaks associated with fruit or vegetables this danger signal has been neglected. These considerations refer to canned fruit or vegetables. How far they apply to preserved meats or other foods, the flavour of which may mask the odour of botuline growth, is uncertain and requires investigation.

[1] THE LANCET, 1918, i., 568, 569.
[2] Food Poisoning and Food Infections. 1920. Cambridge University Press.
[3] Botulism and Canned Fruits and Vegetables, Medical Officer, July 15th.

ALLOCATION OF GRANTS BY THE VOLUNTARY HOSPITALS COMMISSION.

THE Voluntary Hospitals Commission have now come to a provisional decision with regard to the allocation of the Government grant between the metropolitan and provincial areas (including Scotland). "Subject to a final adjustment of the figures when all the areas of the United Kingdom have put forward their claims and rendered the account of the deficit for 1921, the Commission have resolved that the sum of £225,000, including the amounts already voted, be appropriated to London and that the sum of £275,000, including the sums already voted, be appropriated to the remaining areas." Lord CAVE'S Committee found that the deficits for 1920 were £463,413 for the metropolitan hospitals and £574,905 for the hospitals in the provinces and Scotland; they estimated that the total deficits for 1921 would be approximately £1,000,000, and the Government grant was based upon these figures, but the 1921 deficit in the metropolitan hospitals proved to be lower than the estimate. The actual 1921 deficits have not yet been ascertained for all extra-metropolitan hospitals, but the figures now available indicate that the provincial deficits will show approximately the same reduction as those in London. The apportionment of the total grant between the metropolitan and other hospitals should, therefore, correspond fairly closely to the ratio between the total deficits in London and in the provinces. The Commission have decided that unless exceptional circumstances can be shown they will be unable to consider claims, in respect of 1921 deficits, received later than Nov. 30th of the present year. Local committees should, therefore, point out to all hospitals within their areas which have not yet sent in their claims the desirability of making early application.

AUSTRALIAN AND NEW ZEALAND MEDICAL ASSOCIATION IN ENGLAND.—This Association was founded on June 22nd in order to assist medical visitors from Australia and New Zealand with information, or, if necessary, with advice, concerning the following topics: (1) The facilities afforded by various institutions for preparation for higher examinations (M.R.C.P., D.P.H., F.R.C.S. Eng. and Edin.); (2) post-graduate work and special clinics; (3) house appointments and clinical assistantships in London and the provinces; (4) lodgings; (5) sports and social life; (6) addresses of members. Membership is open to all medical graduates or undergraduates born in Australia or New Zealand and resident in or visiting England. (Fee, one payment of 5*s*.) Two general meetings, each preceded by a dinner, are held annually, in June and December. As members themselves constitute the only source of information, they are requested to communicate, in writing, whatever useful knowledge they may have acquired concerning the above and kindred topics to the secretaries, Mr. E. T. C. Milligan, F.R.C.S., and Mr. Bedford Russell, F.R.C.S., at 86, Harley-street, London, W. 1.

Annotations.

"Ne quid nimis."

MEDICAL DEFENCE.

WE print this week in our correspondence columns a letter from six distinguished surgeons and practitioners who charged themselves voluntarily with putting right a miscarriage of justice which befell a colleague. The action for negligence brought against Dr. H. Wood-Hill, of Beccles, at the Suffolk County Assizes in November last was reported in THE LANCET at the time and the main facts are recapitulated in the letter signed by Sir Robert Jones and others. The serious aspect of the assize judgment is pointed out in this letter. Heretofore a medical practitioner, using the ordinary care and skill which might rightly be expected of him, has felt some confidence that he would run little risk of an adverse verdict in an action for alleged negligence. That is no longer so, and the moral is that no medical man in practice can wisely trust entirely to his sense of conscious rectitude. He must join with a group of other practitioners similarly situated in order to avoid such a fate as overtook Dr. Wood-Hill. He exercised all the skill at his disposal, he adopted modern methods of treatment, and yet he incurred an adverse verdict when the case finally did not do well after it had passed out of his hands. There was, of course, some divergence of opinion among the experts called to give evidence at the assizes—it is a privilege of experts to find a region where they can differ—but the overwhelming consensus of opinion that Dr. Wood-Hill was hardly treated is evident from the result of the appeal which brought in a net total of £1730 subscribed by his professional colleagues in all parts of the world. The sum is still unfortunately £500 short of the total costs of the action and of the damages awarded. The special virtue of participating in a medical defence scheme is that in nine cases out of ten the action is withdrawn at an early stage before enormous costs accrue. Zest for fight with imperfect weapons deserts the combatant and his legal advisers when faced with a well-equipped unit such as a "defence union."

HEREDITARY OCULAR DEGENERATIONS.

IN a paper read at the recent International Congress of Ophthalmology held at Washington,[1] Mr. Treacher Collins dealt with the causation of hereditary ocular degenerations. The conditions included in the term "degenerations" comprise post-natal (as distinguished from congenital) cataracts, ocular palsies, including ptosis and various forms of ophthalmoplegia, retinitis pigmentosa, and some other affections about the pathology of which little is as yet known—Leber's optic atrophy, and certain degenerative conditions affecting the cornea, the choroid, and the macular region of the retina. All these diseases are hereditary in some families, and in all of them there exists degeneration in certain groups of cells—cells which, having reached a full degree of development and functional efficiency, have then undergone degeneration. The occurrence of the same degeneration in several successive generations of the same family precludes the absorption of any exogenous toxic substance or the absence of any exogenous essential nutritional material such as a vitamin as a cause. As far as we know there is no endocrinal secretion which either by excess or defect is capable of producing these hereditary affections. We are bound to fall back, says Mr. Collins, on the theory of a want of vital force in the structures involved, or what Sir William Gowers termed "abiotrophy." "Physiologically, in the human body, the vital force fails sooner in some tissues than others—e.g., the thymus gland is highly developed during fœtal life, reaches its maximum size during the third year of life, and shows signs of degeneration which rapidly progresses after the age of ten." In the same way in certain families the vital force on which the life of the crystalline lens depends may be deficient, and so with the ocular muscles, the optic nerve, retina, choroid, or cornea. Metchnikoff would have us believe that the symptoms we speak of as senile degeneration are all the outcome of auto-intoxication. Collins believes that it is as unreasonable to attribute all variations in the time of degeneration of tissues to toxic influences as it would be to account for all variations in the time of development of tissues to such influences. Just as we sometimes meet with precociousness in development, so sometimes we meet with precociousness in degeneration.

As examples of these hereditary ocular affections, a large number of pedigrees of post-natal cataract were recorded by the late Edward Nettleship.[2] Collins records a family of seven—two males and five females—*all* of whom were operated on for cataract at ages from 42 to 58. Their father and two paternal uncles were also operated on for cataract. In a family such as this it seems necessary to assume some inherent defect in the vitality of the lens fibres which results in their degeneration. Similarly in the case of non-syphilitic hereditary ocular palsies the phenomenon is interpreted as an abiotrophy, either of the cells of the nerve nuclei, or of the muscle fibres themselves. Retinitis pigmentosa is similarly interpreted as an abiotrophy of the neuro-epithelium which constitutes the retina. In hereditary disease of the macula the degeneration affects the macular region alone, and the difference in appearance between that and retinitis pigmentosa is accounted for by the fact that in the latter the retinal pigment migrates into the lymphatic sheaths surrounding the retinal vessels and so assumes a bone-corpuscle shape, whereas in the former, there being an absence of blood-vessels at the macula, the pigment appears merely as round dots. In the case of amaurotic family idiocy the degeneration affects the ganglion cells, and the appearances are different again. In the case of Leber's optic atrophy there has been much speculation as to the pathological condition, and especially as to whether it is connected with disease of the pituitary body, but in default of post-mortem evidence this is one of the problems that remains unsolved. It will probably be found that the failure of the optic nerves to maintain their vitality is inherent and comparable with the failure of other parts of the nervous system which we get in Friedreich's disease. A similar explanation would account for those hereditary affections of the choroid and of the cornea which have already been mentioned, but which have not yet been observed for a sufficient time for any definite conclusions to be drawn as to their causation.

[1] American Journal of Ophthalmology, July, 1922.

THE PREVENTION OF DIPHTHERIA.

A MEMORANDUM recently issued by the Ministry of Health calls attention, in view of the persistent high incidence and mortality of diphtheria, to the supply and administration of diphtheria antitoxin, to the use of the Schick test, and to methods of active immunisation against the disease. Reference is made to the Diphtheria Antitoxin Orders issued by the Local Government Board in 1910, by which local authorities were empowered to supply serum to medical practitioners, and were required to keep and distribute supplies on the advice of their medical officers of health. The necessity of early administration of antitoxin is strongly emphasised, on the grounds that it reduces mortality from diphtheria, shortens the course of the disease and decreases its severity, and lessens infectivity, thereby minimising pressure on bed-space in isolation hospitals. So soon as diphtheria is diagnosed on clinical evidence, the practitioner should either give antitoxin without waiting for bacteriological confirmation, or have the

[2] Bowman Lecture, 1909, Trans. Ophthal. Soc., vol. xxix.

patient removed at once to hospital. Particular attention is advised in cases of laryngeal obstruction or of severe laryngeal catarrh or doubtful "croup" in children, and it is pointed out that presence of the diphtheria bacillus in an otherwise normal throat or nose is not necessarily an indication for antitoxin—there being no evidence that antitoxin causes its disappearance in a chronic carrier, although the latter often suffers from abnormal conditions of nose and throat. As regards the curative dose, it is stated that although no stereotyped procedure can be laid down, experience proves 8000 units to be the minimum in the great majority of cases, whatever the patient's age. In an early case an initial dose of this size, if followed by a definite improvement after about 12 hours, precludes the necessity of further administration. Larger initial doses of from 16,000 to 30,000 units are required if the administration has been delayed until the third or fourth day after onset of the disease. In connexion with the method of injection of the serum, the intramuscular route is given priority, in view of the slower absorption by the subcutaneous route. In very severe and late cases a combination of the methods may be advisable. Prophylactic doses (usually of 500 to 1000 units) are, as a rule, not indicated for contacts under daily observation, but may be desirable in order to confer temporary immunity. It is suggested that medical officers of health should advise local authorities to stock concentrated serum in phials of only two sizes—one containing 8000 units (in less than 10 c.cm.) for treatment, and the other containing 500 units for prophylaxis.

The second part of the memorandum deals with the Schick test for the recognition of persons susceptible to diphtheria, and with the immunisation of such persons by inoculations of a standard toxin-antitoxin mixture. The two methods are described in detail, and the practical value of the Schick test, as already proved by experience in schools, is briefly discussed. It is pointed out that if all new members of the staff of an isolation hospital likely to be exposed to diphtheria infection were to undergo the Schick test before or upon admission, and if active immunisation were then offered to those who give a positive reaction, the occurrence of the disease amongst hospital staffs would be much reduced. The memorandum closes with a note on the necessity for obtaining the consent of the authorities concerned, and of the parents or guardians of children, before the test is applied in schools, and with a statement to the effect that the Ministry does not itself supply material for the Schick reaction; the latter may be purchased from various firms of repute. It is of use to the Ministry to hear of such experience, however, and medical officers of the Ministry are prepared to advise and assist if called upon to do so.

THE SCOTTISH CENSUS.

WE have received from the Scottish Stationery Office an earnest of the report on the Census of June, 1921, in the form of two parts [1] of the first volume, one of which (Part 5) deals with the county of Aberdeen, the population of which has decreased by 3·6 per cent. since the Census of 1911. In spite of this decrease the excess of females over males nevertheless shows an increase, being now 6174 out of 153,000 in the county, exclusive of Aberdeen itself, a ratio of 108·4 to 100. The population shows a remarkable preference for the county of its birth; excluding the city, 97·5 per cent. of the inhabitants were born in Scotland, and of these the vast majority—131,500 out of 149,500—in the home county, the remainder chiefly in the neighbouring counties of Banff, Kincardine, Lanark, and Moray. 405 persons in the county are reported as being able to speak Gaelic, a diminishing number, and all speak English in addition. Agriculture and personal service account for almost half of the total occupations in the county; commerce, transport, furniture-making, food, drink, and tobacco-making and fishing each having a percentage-rate of 4 or more. Part 6 concerns the county of Argyll with a population which diminished steadily from 101,000 in 1831 to a little over 70,000 in 1911. In the recent decennium there is a nominal increase of 8·4 per cent., largely due to inflation by summer visitors, since the Census day was postponed from April until June. A number of the mainland parishes and most of the insular parishes have diminished very largely from a population which reached its maximum between 1821 and 1841. The excess of females over males has risen during the decennium from 50 to 5530, partly owing to removal of 1800 men of the Royal Navy. Of the inhabitants, 93·2 per cent. were born in Scotland. Argyll being one of the counties in which the Gaelic language survives, the principal facts of Gaelic speaking are stated in a table. Only 426 persons are now enumerated as speaking Gaelic only, nearly all these being over the age of 50 or under the age of 9, when presumably the deficiency can still be made good. Thirty years ago 22 per cent. of persons could only speak Gaelic, a proportion now reduced to 3·5 per cent. Agriculture gives occupation to 22 per cent. and personal service to 16 per cent. of the inhabitants. Transport and commerce each account for about another 10 per cent.

The remainder of the first volume, which contains in 37 parts information required for local administrative purposes, will be issued as it is ready. The second volume will contain information applicable to Scotland as a whole, and the third will be devoted to special statistical studies. In each of the local sections now appearing, besides the population of burghs, county public health districts, and civil parishes, there is given much information regarding civil parishes, registration districts, ecclesiastical parishes, special water, drainage, lighting, and scavenging districts, and other figures serviceable to the public health authorities. The essential figures of age-distribution are set out along with orphanhood or conjugal condition. Occupations are tabulated by reference to a list containing 612 separate items. Particulars are given of housing conditions, especially in relation to the number of persons occupying one or more rooms.

[1] The price of these sections of the report is: Aberdeen, 9*s.* 2½*d.*; Argyll, 7*s.* 2*d.*; post-free from H.M. Stationery Office, Kingsway, London, W.C. 2.

KRÖNIG'S AREAS IN PULMONARY TUBERCULOSIS.

IN 1907, Krönig described areas, above the clavicle and scapula, of reflected apical resonance the boundaries of which he found to be considerably encroached upon in pulmonary disease. Each area consists of a narrow isthmus, widening in front to its base, which extends from the inner end of the clavicle to the junction of its middle with the outer third of the bone. The isthmus widens again at the back, where its base extends from near the first dorsal spine to a point opposite the junction of the middle and outer third of the spine of the scapula. In the August number of *Tubercle* Dr. A. Niven Robertson, of the Derbyshire County Sanatorium, publishes an account of his investigation of these areas in relation to disease of the lungs, and after an examination of 124 pulmonary apices he has come to the conclusion that disease may be present, as revealed by the ordinary methods of percussion and auscultation, although the size of the isthmus on the diseased side is normal. When both lungs are healthy, Krönig's areas are normal, but the converse is not always demonstrable. In 46 cases Krönig's areas were examined both on admission and on discharge from the sanatorium, and of the 92 apices examined, 41 showed an increase of these areas, 33 a decrease, and 18 no change. In 54 apices the tidal expansion became less under treatment, and only in 16 apices was the tidal expansion increased. This observation tallies with the fact that under successful treatment the lung becomes fibrotic, and that in the arrest of chronic

pulmonary tuberculosis new lung tissue is not formed, but is replaced by scar tissue. It would appear from this careful research by Dr. Niven Robertson that, as contraction of Krönig's areas is demonstrable in non-tuberculous diseases of the lungs, its value as a sign of pulmonary tuberculosis is limited. But though the sign is not pathognomonic, it is a useful supplement to other signs, and it may be present, as Fishberg has pointed out, before cough and changes demonstrable by auscultation.

CINCHONA BARK IN THE BRITISH EMPIRE.

IN 1916 the Secretary of State for India invited the Imperial Institute Committee for India to inquire into the possibilities of further commercial usage of the principal Indian raw materials—prominent among them being cinchona bark—in the United Kingdom and other parts of the Empire. The Committee for India thereupon formed a number of special committees to deal with the groups of materials selected for this Indian Trade Inquiry, and the reports of these committees have now been published.[1] The Special Committee on Cinchona Bark had mainly to consider the means of increasing the demand for the commodity within the Empire. During the five years ending 1916–17 Indian exports of cinchona bark averaged 600,000 lb. per annum; in 1917–18 they fell to 40,000 lb., and in the following two years were 27,000 and 198,000 lb. respectively. These exports consist chiefly of druggists' bark—i.e., barks of *Cinchona succirubra*, *officinalis*, and *robusta*, usually exported as quills. The quality and supply of this type are apparently satisfactory, and the Committee state that no action is required in this connexion. The main demand is for factory bark—i.e., barks of *Cinchona ledgeriana* and certain cinchona hybrids, rich in quinine and containing comparatively small amounts of the other cinchona alkaloids, used for the manufacture of quinine, and usually exported in the form of chips. India produces factory bark, but exports very little, as the two Government quinine factories use practically all the available supply. The Committee, having assured themselves that there is a large demand within the Empire for factory bark, are of opinion that a serious effort should be made to produce in India sufficient of the commodity to meet a much larger proportion of the requirements of the Empire. These annual requirements they estimate at 8,000,000 lb., of which nearly 7,000,000 lb. are now derived from foreign sources, principally from Java. The technical difficulties could, they state, no doubt be overcome, but certain commercial difficulties need attention. For some years before 1913 there was an over-production of cinchona bark, which, but for an arrangement made between quinine manufacturers and Java planters, might have led to a considerable reduction in the Java output. Over-production might, therefore, seriously hamper extension of cinchona planting by private enterprise in India. The Committee do not consider it necessary that any attempt be made to enable India to meet the whole British demand for cinchona bark, and any extension would have to be carefully considered. Such extension of output is, however, desirable; the Committee suggest that joint action by the Imperial and Indian Governments might secure its consumption within the boundaries of the Empire. This would mean the extension of quinine manufacture in the United Kingdom, where at present quinine is extracted from bark in one factory only. To extend this manufacture at present would be difficult, since adequate supplies of bark can only be obtained through the Kina Bureau, which is controlled by the Dutch and Javanese interests. On the financial side, the method of fixing prices for bark adopted by the Kina Bureau seems to satisfy both planters and manufacturers; and the Committee see no reason why the Government of India should not secure for its bark, or guarantee to planters in India, the price fixed for Java bark by the Bureau in Amsterdam; it is understood that this basis has been adopted in the arrangement between British planting companies in Java and the British quinine factory. The Government factories in India appear to be financially successful, and the manufacturing side seems to present no difficulty. At least one more factory, in England or in India, would be necessary in event of extension of planting in India. Until regular supplies were forthcoming, bark would have to be obtained from Java; if the latter arrangement could not be made, provision of the factory would have to wait till the Indian plantations were actively producing bark. The Committee consider that the Empire should not have to depend so largely on a foreign country for this important product. A system of storage with intent to secure supplies against possible shortage in time of war would not only necessitate withdrawal of a quantity which might seriously dislocate the market, but would also lock up capital which might more usefully be employed in encouraging the cultivation of cinchona and the manufacture of quinine. The Committee state that whilst the location of new cinchona plantations and the extension of quinine manufacture in India are outside the scope of their report, these important subjects are now under consideration by the Government of India.

[1] Drugs and Tanning Materials: Reports on Cinchona Bark and Myrobalans. (Imperial Institute Indian Trade Inquiry.) London: John Murray. Price 4*s*.

THE WALKER TESTS FOR ASTHMA.

IT would be both unwise and ungrateful to minimise the importance of the work done by Dr. I. Chandler Walker and others with regard to the sensitisation tests for asthma, and there can be no doubt that in a certain number of cases these tests have been dramatically successful, teaching the patient the cause or causes of his illness, and enabling him to avoid them. He may, for example, be shown to be peculiarly sensitive to horses, cats, or certain articles of food, the avoidance of which means the evasion of an attack of asthma. There is a Sherlock Holmes atmosphere about the attempt to trace an attack of asthma to a sausage into which a worn-out horse has strayed. But it would be well to point out that for one such brilliant diagnosis, there may be several failures, and this is the lesson taught in a recent paper by Dr. A. de Besche,[1] who for many years has been investigating the relation of asthma to protein sensitiveness. In 86 cases of asthma he has tried to find out by the Walker tests which proteins were to blame, and he was confronted with the problem of scratching the skin of each patient in about 60 places so as to test a corresponding number of Walker's test substances. His patients were private, not hospital cases; being scarified in 60 different places did not appeal to them, and he had to be satisfied with a score or so of the most likely test substances. In 23 cases he obtained a positive reaction to the conjunctival test devised by himself, the patient's eye being touched by a finger with which a horse had just been stroked. Only 10 of these 23 gave a positive reaction to horse serum, and only 17 to Walker's horse test substance. The conjunctival test also proved to be the most instructive in cases of asthma due to sensitiveness to the dog or cat. In five instances sensitiveness to horses or cats was passively transferred to guinea-pigs, the serum of patients with horse or cat asthma being injected into the peritoneal cavities of guinea-pigs. The condition can also be transferred from man to man; three intracutaneous injections were given, one consisting of serum from a horse-asthmatic, one of serum from a normal person, and one of normal saline solution. None of these three injections gave a distinctive reaction, but when, 24 hours later, the sites of all three injections were inoculated with horse serum, the first site showed a violent pomphoid reaction, whereas the other two sites showed no reaction. Interesting as these investigations are, Dr. de Besche admits that, in the overwhelming majority of cases of asthma, sensitisation tests prove negative,

[1] Norsk Magazin for Lægevidenskaben, May, 1922.

and the physician must content himself with the old-fashioned diagnosis, bronchial or nervous asthma. His own high percentage of cases of horse asthma could be accounted for by the fact that his earlier publications on the subject brought him many patients who had already suspected a relationship between their attacks and contiguity with horses.

MILK INSPECTION IN AMERICA.

THE American Committee on Municipal Health Department Practice, to whose findings we have on several occasions drawn attention, has now published[1] the chapter of its report dealing with milk inspection in American cities with a population of 100,000 and over. The following points are of interest in Britain.

Pasteurisation is not yet general except in the larger cities, and only 31 out of the 83 cities studied have a grading system. In New York the estimated per capita consumption of milk is over 0·71 pint: in 68 cities it was found to work out at an average amount of 0·66 pint per day. Nearly all the larger cities employ veterinarians as well as other inspectors for milk inspection. In the smaller cities this statement does not hold, and in some of the larger cities, as Cleveland and Minneapolis, the veterinarians are part-time employees. For all cities the number of veterinarians employed averages 1, of other inspectors 6, per 400,000 population. The amount of inspection of sources of milk-supply varies greatly, as does also the practice as to the use of score cards. Inspection of milk depôts in the larger cities is at least weekly, in Baltimore four times a week. In smaller cities it is usually monthly or semi-annually. The requirements as to maximum permissible temperature of milk also vary greatly. Grouping all cities together, of 55 cities, 1 insists on a temperature not exceeding 45° F., 27 on 50°, and 27 permit 55° or over at the farm. In transit in the same cities, 29 permit a temperature of 50° and 26 of 55° or over. At the depôts 2 require a temperature not exceeding 45°, 34 not exceeding 50°, while 19 allow 55° or over. At the time of delivery in 33 cities the temperature must not exceed 50°, and in 22 it may reach 55°. In some cities, as Washington, New Orleans, Providence, there is no requirement in this respect. The medical control of milk handlers varies greatly, including the practice as regards employees in pasteurisation plants. In Pennsylvanian cities food handlers are required to be examined physically twice a year and to present certificates of health. New York requires physical examinations for handlers of Grade A raw and pasteurised milk. A routine attempt to detect disease carriers is made in only 24 of the cities studied. The machinery for the detection and reporting of cases of communicable disease on the dairy farm depends largely on the coöperation of the dairymen and of the rural physicians.

Laboratory control of milk-supplies is exercised in nearly all cities, the samples examined averaging 130 to 140 per 100,000 of population. In 39 cities tuberculin testing is required of all herds from which raw milk is sold. In 14 additional cities this is required for Grade A milk, and in 7 others for certified milk. The enforcement of this testing and its consequential action is effected in more than half of the cities. For most of the cities the proportion of cows annually tested would probably not exceed 10 per cent. Usually the owners of reacting animals receive some compensation for their destruction either from the State or from the city. In at least 10 of the 12 larger cities under observation, all milk, except that from tuberculin-tested cows, must be pasteurised, and about 95 per cent. of the milk of these cities appears to be thus treated. In the second and third group of cities less than one-half have a pasteurisation regulation, and in the smaller cities only 9 per cent. of the cities pasteurised 95 per cent. or more of their total milk-supply. Repasteurisation is permitted in 29 cities. In the larger cities it is definitely prohibited. The supervision of pasteurisation is by inspection of plants. Temperature charts are used for control of pasteurisation in 16 cities, recording thermometers being required in 65 cities. The cities not making this requirement include Washington, Pittsburgh, Providence, and Albany. The "holding system" of pasteurisation is required in all but 20 cities studied, a temperature of 145° for 30 minutes being commonly enforced. Whether this is actually obtained, or whether there is excessive heating of some parts of the milk and inadequate heating of other parts are points requiring further investigation, but not mentioned in the report.

The Committee regards a system of grading based on dairy scores and bacterial counts as the foundation-stone of efficient control of the milk situation, and expresses its disappointment that the grading system is in use in only 31 of the 83 cities studied, and that among these 31 there is little uniformity as to requirements. In San Francisco milk is not graded, but the whole supply is reported pasteurised. The Committee concludes that the great mass of the milk-supply should be protected by grading and pasteurisation, but that it is desirable to have available a small amount of very high-grade raw milk, such as is provided through the activities of certified milk commissions. In 46 cities studied there are such commissions, but the amount of milk thus supplied probably is only about 500 quarts per day, as against the total milk-supply of 33,000 quarts per 100,000 population.

In conclusion, the Committee expresses the opinion that with the development of an adequate system of grading and pasteurisation the cost of milk control need not increase very greatly. If a similar opinion could be expressed on behalf of the consumer, the outlook, given efficient administration, would be satisfactory.

[1] American Journal of Public Health, July, 1922.

A GERMAN VIEW OF MEDICAL ETHICS.

THE supreme Prussian medical court of honour, the body officially entrusted with the task of dealing with all questions affecting professional conduct, has had occasion recently to draw attention to the fact that the exercise of the art of healing rests on an ethical conception which must of necessity remain unsullied by any suspicion of commercialism. A member of the profession was accused of having supplied spectacles to his patients, charging for the same a price higher than that of their actual cost to him, in other words, of making a profit on each transaction. In condemning the offender for having transgressed against the dignity of the profession, the court founded its verdict on the following premisses:—

> The exercise of the medical profession is coupled with special responsibilities, and is based on scientific training. It is not undertaken, and should not be undertaken, for the sole purpose of "making money," as if it were a trade. . . . . The medical, as well as the legal profession, possess a common and distinctive characteristic, inasmuch as both are called upon to fulfil fundamental purposes in the interest of the general public—i.e., the safeguarding of health, and the maintenance of justice, in accordance with a definite course of scientific training laid down by the State, both callings entailing special responsibilities upon their members. Medical practitioners, as well as lawyers, are called upon to place their mental faculties at the disposal of the community, and therefore do not form an economic factor in the commonwealth. Basing on these principles, it follows that the medical profession must be kept free from any form of commercialism. For this very reason a professional standard of ethics has evolved, which precludes medical practitioners from adopting many courses which are perfectly legitimate when followed by business men and traders, but which are not open to members of the medical profession, such as public advertisement, the sale of practices, or the prohibition of competition. From the point of view of professional dignity, it is inconceivable that a medical practitioner should supply remedial agents or appliances required in the exercise of his calling for profit, with the sole object of increasing his income. In doing so a medical practitioner stoops to combine the exercise of his calling with purely business features in a manner incompatible with professional standards.

Comparative medical ethics would make an interesting study, for evidently the sale of medical practices

is regarded differently by our own General Medical Council and the corresponding Prussian court of honour. We have the impression that the clear thinking in this case is on our side. With us the trade in practices is frank and open: no one would condemn a medical man for making a trade in spectacles, if he was so minded and possessed the necessary business capacity, any more than in owning shares in rubber or selling his own superfluous garden produce. Here the ethical line would be drawn should a doctor use his professional position to enhance fictitiously the value of the goods. A customer would not pay more than the market value of a cauliflower because it came out of the doctor's garden, nor would he wish to pay more than the market value of any appliance that passed through the doctor's hands. If the doctor's knowledge and advice should actually increase this value the payment should be in the form of a fee for professional services and not in that of an exaggerated price for the appliance. Honest trading does not ill-become a professional man, although he will the more easily avoid suspicion by keeping his trade and his profession separate. For how is a doctor who markets appliances to meet the imputation that his professional opinion leans to recommending their use?

INTER-EPIDEMIC INFLUENZA.

ONE of the several still unsolved problems of influenza is whether the so-called attacks of grip or influenza, occurring apart from a considerable epidemic, are true influenza or some other catarrhal disease. The view taken in the official report on the subject issued by the Ministry of Health appears to be that a pandemic is produced when the potential virulence of the causal organism of influenza, which has presumably been present in the community for many years, rises to a critical and stable level, the exalted virus being possibly aided by an unusual infection of associated or symbiotic organisms. In short, the elements of influenza are endemic and not exclusively invasive, a view which differs from that taken by Dr. Franklin Parsons in his official report on the 1890 pandemic, and still held, we imagine, by the majority of epidemiologists. The official death statistics are not altogether trustworthy. In inter-epidemic periods there is a natural tendency to describe as influenza any acute catarrhal condition, although we may not agree with the explanation of her reason for distrust of the nomenclature of her time, given by the caustic pen of Thomas Carlyle's wife in a letter to a friend: "Medical men all over the world have merely entered into a tacit agreement to call all sorts of maladies people are liable to, in cold weather, by one name, so that one form of treatment may serve for all, and their practice be thereby greatly simplified."

The July issue of the *American Journal of Hygiene* contains a useful comparative study of English and American figures by Dr. Edwin O. Jordan, of Chicago. Dr. Jordan shows that in inter-epidemic years there is a lack of correspondence between pneumonia and influenza waves, though there is difficulty in determining this point in view of the paucity of deaths from influenza. This is a possible point against the influenzal character of inter-epidemic "influenza." The change of age-incidence offers more certain evidence. Thus in 1900–17 in the U.S. registration area more than half the deaths ascribed to influenza occurred at ages over 60, in 1918 less than 5 per cent. occurred over 60 years of age, and a somewhat similar disturbance of ages of reported deaths from pneumonia occurred. In England, prior to 1890, a marked change is seen between the age-incidence of "influenza" in 1876–89 and in 1890, as shown in one of Dr. Parsons's tables. Dr. Jordan summarises the evidence adduced in his contribution by stating that the 1918 influenza epidemic is sharply marked off from the "influenza" of the preceding years by (1) the greater relative mortality at ages 25–35; (2) the relatively increased mortality in the white race as compared with the negro; (3) the higher mortality in white males than in white females; (4) the relatively increased mortality in coloured males as compared with females of the same race. Dr. Jordan cites no American experience of age-incidence of fatal influenza in 1890. In England this differed essentially from the age-incidence of influenza in 1918. If importance is to be attached to difference in age-incidence between epidemic and inter-epidemic influenza, should not the same rule apply to a comparison of the epidemics of 1890 and 1918? One would hesitate to suggest that these were in reality two different diseases. The obscurity of this mysterious change in age-incidence—assuming that it was a change in the age-incidence of the same disease—is matched by our lack of knowledge of the cause or causes which produce the high degree of infectiveness or dispersiveness of pandemic influenza. Dr. Jordan's conclusion is that fundamental differences in age, sex, and race mortality in different outbreaks of a specific disease have never been shown to occur, and considers that there is no escape from the conclusion that the so-called influenza of inter-epidemic years is in whole or in part different from the influenza of 1890 and 1918. We are not certain that changes in age-distribution imply a different disease. Under the influence of vaccination, the age-distribution of small-pox has changed, and it has become preponderantly a disease of adult life instead of a disease of childhood. Can the gradual immunisation of adults by inter-epidemic influenza in recent years explain the remarkable change of weight of mortality from late adult to adolescent and early adult ages?

THE RELATION OF VITAMIN-A TO RICKETS AND GROWTH IN PIGS.

As the result of the experiments of Prof. and Mrs. E. Mellanby on the production of rickets in puppies reared on a diet devoid of vitamin-A, the view has gained ground that a deficiency of this vitamin is the chief ætiological factor in the causation of the disease. But recent experiments carried out on pigs by Drs. S. S. Zilva, J. Golding, J. C. Drummond, and K. H. Coward have shown that these animals are much less susceptible to lack of vitamin-A than are dogs, inasmuch as well-developed rickets cannot be produced by the withholding of this accessory factor from the food. In the current number of the *Biochemical Journal* these authors report a further series of experiments in which they have investigated the effects on pigs of a diet deficient both in vitamin-A and also in calcium salts. Eight pigs, all of the same litter, were used. These were divided into four pairs, which received, respectively, diets of the following natures:—

(1) Deficient in vitamin-A and in calcium.
(2) Deficient in vitamin-A with abundant calcium.
(3) Abundant in vitamin-A but deficient in calcium.
(4) Abundant in vitamin-A and abundant in calcium.

The fat-soluble vitamin was supplied in the form of cod-liver oil—the control pigs receiving inactive olive oil in equal amount—and the calcium partly as chalk and partly as phosphate in bone charcoal. Further, in order to ensure that the young pigs should have no initial store of the vitamin, the mother was kept on a diet restricted in vitamin-A both before and during pregnancy, and also during lactation. Incidentally it was found during these initial stages of the experiment that the sow was capable of rearing her young satisfactorily and normally in spite of the deficiencies of her diet. It should be mentioned that throughout the experiment the anti-scorbutic and anti-neuritic vitamins were supplied in the form of lemon-juice and yeast extract respectively. After a period of 54 days on the experimental diets, marked differences between the animals of the four groups began to be evident. While the animals in group (4) were heaviest, and in the best condition, and those in group (3) were in good condition, groups (1) and (2) had developed "saddle" backs and showed lack of

vitality. Furthermore, the animals of group (1) were weak on their legs, and their joints were painful to pressure. One of the animals in this group broke its vertebral column as the result of a fall. The experiment lasted 145 days in all, at the end of which period the animals were slaughtered. The post-mortem examination revealed no striking abnormalities. The fat of animals in groups (1) and (2) had a lower melting-point than normal pigs' fat. The bones of the animals in group (1) were more easily fractured than those of the other pigs. Histological examination of the ribs showed in all groups a certain degree of osteoporosis: this was very slight in group (4), more obvious in groups (2) and (3), and was pronounced in group (1). Finally, in this last-mentioned group frequent incursion of the proliferating cartilage into the bone-marrow was observed, associated with defective deposition of lime salts in the zone of provisional calcification. But there was no increase in the amount of osteoid tissue, and no such faulty deposition of calcium in the newly-formed bone as is characteristic of true rickets.

THE ADULTERATION OF FOOD AND DRUGS.

A BLUE-BOOK [1] of 16 pages, entitled "Sale of Food and Drugs Acts," contains an extract from the annual report for 1921–22 of the Ministry of Health, along with some details of the reports of public analysts for the year 1921. Together they provide evidence of the need for public control of food and medicinal products. The number of analysts in England and Wales is now 232; they deal with areas of differing size, the total number of samples analysed during the year being more than 113,000. Of these samples 6·7 per cent. were the subject of adverse report, against 7·1 per cent. in 1920. A few areas have a surprisingly large proportion of samples found defective out of the total examined. The figures are above 20 per cent. for the counties of Oxford, Anglesey, and Cardigan, and the borough of Newark-on-Trent. It is only fair to add that in each case the total number of samples taken was small. Last year the Isle of Wight, the boroughs of Barnsley, Berwick-on-Tweed, Darlington, Grantham, Grimsby, Hartlepool, Reigate, and York were delinquent, and it is good to note that none of these places reappears in this year's black list. Only the county of Cardigan maintains its notoriety. Among the articles examined a high rate of adulteration is found in descending order under the headings cream and preserved cream, spirits, milk, drugs, cheese, mustard, flour, and beer. In London the proportion of adulterated milk samples was 5·1 per cent., against 6·7 and 7·7 in the immediately preceding years. Of the 678 adulterated samples 357 were found to contain added water, 250 were deficient in fat, 33 erred in both ways, 28 had been artificially coloured, 8 contained boric acid, and 2 formaldehyde. The complaint against cream was, as usual, the content of boric acid in excess of the permitted amount; no other preservative was reported. The prescribed limit of water in butter was more frequently exceeded than in previous years. Forty-five out of 1210 samples of baking powder were condemned on account of deficiency in available CO_2. Seventy-three out of 168 samples of preserved peas were condemned for containing copper salts for colouring purposes—a heavy fine was inflicted for the sale of spinach containing 6·8 grains per pound of $CuSO_4$. Brightly-coloured green vegetables in tins should be avoided by the public unless reform follows. A raspberry fruit-juice reported from the county of Durham was found to consist of a sugar solution coloured with coal-tar dye and acidulated with phosphoric acid. Such a drink may be refreshing but obviously possesses none of the virtues of a true fruit syrup. Out of 5500 drugs examined 6·7 per cent. were reported against as not being genuine. The methods of adulteration were the same as reported in previous years, and had not even the interest of being original. The report will be studied by those who are interested in the purity of food and drugs. It makes the need for control very evident.

[1] H.M. Stationery Office. Price 1*s.* 6*d.* net.

AN EPIDEMIC OF STREPTOCOCCUS SEPTICÆMIA.

Dr. L. Howard Smith,[1] of the Department of Pediatrics, University of Oregon Medical School, reports an epidemic of *Streptococcus hæmolyticus* septicæmia which recently occurred in a nursing home among infants, whose ages ranged from 1 to 7½ months. Before the onset of the epidemic the infants, who were all bottle-fed, were in good general condition, gaining weight and having no intestinal disturbances. Suddenly two of the children developed a temperature of 103°–104° F., and showed extreme prostration, a highly inflamed pharynx, and enlarged cervical glands, followed by distension of the abdomen with intestinal paralysis. Stupor set in and both died on the fourth day. Peritonitis and cloudy swelling of the viscera were found at the post-mortem examination. During the next two and a half weeks seven other infants developed similar symptoms and signs, but without the extreme prostration, marked pharyngitis, and cervical adenitis characteristic of the first two cases. Five of these seven children died, and the necropsy findings were the same as those already described. Cultures of the blood taken from the longitudinal sinus showed *S. hæmolyticus* in five out of six cases, and the same organism was found in three out of four cases examined. The leucocytosis varied from 10,000 to 44,000 per cubic millimetre, the average being 22,000. The remarkable features of the epidemic were the sudden onset, the absence of vomiting and diarrhœa, the absence of any apparent localised infection except in the first two cases, which showed marked pharyngitis and cervical adenitis, the absence of pulmonary involvement except in two cases very late in the disease, the generally good appearance of the patient until very near the end, the uniformity of positive blood cultures, and the constancy of peritonitis. The source of infection was obscure. Cultures of the milk showed no *S. hæmolyticus*, and it was also the custom in the home to boil all the milk and water used for feeding for at least three minutes. Dr. Smith is inclined to attribute the outbreak to the presence of two adult carriers in the nursery who, though they had no direct part in caring for the infants nor came in contact with their food-supply, mingled when off duty with those in direct charge of the infants at the beginning of the epidemic.

[1] American Journal of Diseases of Children, August, 1922.

THOSE desiring to avail themselves of the special Post-Graduate Course in General Medicine from Sept. 11th–22nd, arranged by the Fellowship of Medicine, should make early application to the Secretary at 1, Wimpole-street, W. 1, for full particulars and copies of the syllabus. The following subjects will be dealt with: Pulmonary disease, including the X ray aspect, cardiology, neurology and mental disease, pathology, medical ophthalmology, &c.

THE LATE DR. CLEMENT JOHN BAKER.—Dr. C. B. Baker died on August 7th, at sea, on his way home from Uganda. Having joined the Uganda Medical Service in 1903, he had nearly completed 20 years' work in that country. Dr. Baker was born in 1872, received his medical education at the Middlesex Hospital, London, and qualified M.R.C.S., L.R.C.P. Lond. in 1898. He was for a time house surgeon at the hospital, and after two years' private practice served as a civil surgeon in the South African war. Whilst medical officer at Entebbe, Uganda, he found trypanosomes in the blood of human beings, and was the first to announce their discovery in man in Uganda; Castellani's previous discovery had not been published. Dr. Baker was appointed first chief sanitary officer for the Uganda Protectorate, and held the post until his death. He was very popular among all classes of the community in Uganda. He leaves a widow.

MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS.

WE are requested by the Registrar of the General Medical Council to give publicity to the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. The list includes all untraceable names from A to G in the Register, as it is only this section which has come under review this year. Anyone who finds his or her name included in this list should communicate immediately with the Registrar (E) of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1; or (S) of the Scottish Branch Council, 20, Queen-street, Edinburgh; or (I) of the Irish Branch Council, 35, Dawson-street, Dublin. Since this list was prepared a large number of further inquiries have been sent out, but it would still be advisable for any practitioner whose name appears in the list to send a communication to the Registrar.

Abbott, Fredk. Ernest, L.S.A. 1883 (E).
a'Beckett, William G., M.R.C.S. 1860 (E).
Ackland, Frederick C., L.R.C.P. & S. 1899 (S).
Acton, Thomas, M.R.C.S. 1900 (E).
Adam, Basil J., M.B. 1886 (S).
Adams, Melville M., M.B. 1912 (E).
Adams, Russell G. W., F.R.C.S. 1905 (S).
Adler, Saul, M.B. 1917 (E).
Agnew, Francis Vere, M.D. 1912 (I).
Ahern, Mary J. (Miss), L.R.C.P. 1913 (I).
Aiken, James, L.R.C.P. & S. 1909 (S).
Ainsley, James E., L.R.C.P. & S. 1916 (E).
Aitken, Arthur N., M.R.C.S. 1920 (E).
Aitken, Charles, M.B. 1883 (S).
Aitken, William B., M.B. 1883 (E).
Alcorn, John M., L.R.C.P. 1905 (I).
Alcorn, Robert G., L.R.C.P. 1873 (I).
Alcorn, Robert M., L.R.C.P. 1914 (I).
Alcorn, Samuel A., M.B. 1883 (I).
Aldred, John C., L.K.Q.C.P. 1883 (E).
Alexander, Alfred G., M.B. 1906 (I).
Alexander, John, M.R.C.S. 1880 (E).
Alexander, Joseph, M.B. 1918 (S).
Alexander, Robert H., *M.C.*, M.B. 1914 (S).
Alexander, Walter S., M.B. 1890 (I).
Allan, William, M.B. 1887 (S).
Allen, Patrick Joseph, M.R.C.S. 1871 (I).
Allen, Sydney H., L.R.C.P. & S. 1901 (S).
Allen, Thomas, L.S.A. 1869 (E).
Alleyne, Evelyn Addison W., M.R.C.S. 1909 (E).
Allport, Evett G., M.R.C.S. 1902 (E).
Ambrose, Charles Going, M.B. 1919 (E).
Ambrose, William C., M.R.C.S. 1898 (E).
Amenabar, Julio D., M.R.C.S. 1897 (E).
Amyot, Thomas E., M.B. 1904 (E).
Anderson, Arthur L., M.B. 1898 (E).
Anderson, George M., M.B. 1890 (S).
Anderson, Henry Morris, M.B. 1919 (S).
Anderson, James R., M.R.C.S. 1889 (E).
Anderson, John G., *M.C.*, M.B. 1914 (S).
Anderson, Thomas C., M.B. 1882 (S).
Andrew, Miss Agnes W., M.B. 1915 (S).
Andrew, Charles Todd, M.B. 1902 (S).
Andrews, John J., L.R.C.P. & S. 1904 (S).
Ansari, Mukhtar A., M.B. 1905 (E).
Apergis, Hector D., M.R.C.S. 1917 (E).
Appleyard, Francis E., M.B. 1896 (E).
Armistead, William, M.B. 1865 (E).
Armstrong, Cedric W., M.R.C.S. 1917 (E).
Arnott, Henry G., L.R.C.P. & S. 1902 (E).
Arthur, Richard, M.B. 1888 (S).
Arundel, Robert J., M.D. 1895 (I).
Asbury, Robert A. J., M.B. 1900 (S).
Askins, John Hawkins, M.B. 1904 (I).
Aspland, William H. G., L.R.C.P. 1896 (E).
Atkins, Thomas G., M.D. 1878 (I).
Atkinson, Frank L., M.B. 1903 (S).
Atkinson, John L., M.R.C.S. 1909 (E).
Attfield, George C., M.R.C.S. 1850 (E).
Attridge, James C., L.R.C.P. 1916 (I).
Aubrey, Richard, L.R.C.P. 1869 (E).
Auld, Robert William, M.B. 1901 (S).
Austin, Mrs. Cristina, M.B. 1905 (S).
Austin, Robert Blackie, M.B. 1910 (S).

Bagnall, Robert G. A., M.B. 1907 (S).
Bailey, John G., L.A.H. 1914 (I).
Baird, Alexander James, M.B. 1900 (S).
Baird, James A., L.R.C.P. & S. 1901 (S).
Baird, Miss Mary A. H., M.B. 1914 (S).
Baker, Alexander, M.B. 1895 (E).
Baker, Charles H. N., *M.C.*, L.R.C.P. & S. 1913 (S).
Baker, George W., L.R.C.P. 1882 (E).
Baker, Oswald, L.R.C.P. 1869 (E).
Ballachey, Henry H., L.R.C.P. 1884 (S).
Banajee, Hilla Furdoonjee, L.R.C.P. 1902 (S).
Banister, Thurstan E., M.R.C.S. 1912 (E).
Bankier, Alexander M., M.B. 1885 (S).
Barber, Thaddeus B., M.B. 1892 (S).
Barber, William J., L.R.C.P. & S. 1906 (S).
Barclay, William, L.R.C.P. & S. 1902 (S).
Barker, Walter H., M.R.C.S. 1875 (E).
Barlow, Frederick C., L.R.C.P. 1909 (S).
Barnard, John H., *O.B.E.*, M.R.C.S. 1878 (E)
Barnardo, George F., M.B. 1892 (S).
Barnes, George A. E., M.R.C.S. 1919 (E).
Barras, Mrs. Kathleen, M.B. 1919 (E).
Barrett, Sidney E., M.R.C.S. 1886 (E).
Barrington, Nicholas W., M.R.C.S. 1857 (E).
Barron, Willie N., *C.M.G.*, *M.V.O.*, M.R.C.S. 1896 (E).
Bartlett, Edward Leslie, M.R.C.S. 1903 (E).
Bartlett, Mrs. Gertrude E., M.B. 1908 (E).
Bashford, Ernest F., M.B. 1899 (S).
Basu, Dhirendra N., M.R.C.S. 1918 (E).
Batchelor, George A., M.R.C.S. 1914 (E).
Batchelor, Ralph C. L., M.B. 1914 (S).
Bateman, Edgar Noel, F., L. Med. L.S. 1911 (I).
Bates, Herbert, M.B. 1901 (E).
Battersby, Charles H., M.R.C.S. 1863 (I).
Bayfield, Thomas F., L.R.C.P. & S. 1903 (S).
Beamish, Miss Henrietta O'D. M., L.R.C.P. 1907 (I).
Beamish, Thomas, L.R.C.S. 1862 (I).
Bean, John W. B., M.R.C.S. 1907 (E).
Beattie, Joseph A., L.R.C.S. 1877 (I).
Beaumont, William H., L.S.A. 1887 (E).
Beaven, Miss Grace M., L.M.S.S.A. 1919 (E).
Bedford, Charles F., L.S.A. 1868 (E).
Beeston, William R. C., L.R.C.P. 1911 (I).
Bell, Mrs. Claudia A. P. R., M.B. 1898 (E).
Bell, Eileen M., M.B. 1916 (I).
Bell, Hugh T. S., M.R.C.S. 1896 (E).
Bell, James B., M.B. 1893 (S).
Bell, John H. M., M.B. 1901 (S).
Bellamy, Rayner L., L.R.C.P. & S. 1917 (S).
Benbow, Thos. A. P., M.R.C.S. 1916 (E).
Bennett, James F., M.B. 1900 (S).
Benson, Alexander V., M.R.C.S. 1904 (E).
Bernau, Henry F., M.R.C.S. 1890 (E).
Berne, John G., L.R.C.P. 1894 (E).
Berry, Richard J. A., L.R.C.P. & S. 1890 (S).
Berry, Robert S., L.S.A. 1892 (E).
Berry, Winslow S. S., M.B. 1904 (I).
Bertram, Thomas D., M.B. 1889 (S).
Bethell, Stanley E., M.B. 1914 (S).
Beveridge, Alexander W., M.B. 1904 (S).
Beyers, Gideon E., M.R.C.S. 1916 (E).
Beyers, Jan M., L.R.C.P. & S. 1914 (S).
Bhagwat, Sakharam R., L.R.C.P. & S. 1908 (S).
Bhalla, Bawa R. S., M.R.C.S. 1917 (E).
Bibby, William A., L.M.S.S.A. 1917 (E).
Bidie, Evan, L.R.C.P. & S. 1902 (S).
Bill, George, M.B. 1892 (S).
Binnie, John F., M.B. 1886 (S).
Birmingham, Alfred, M.B. 1896 (I).
Birmingham, Herbert J., L.R.C.S. 1880 (I).
Bishop, Frederick M., M.R.C.S. 1903 (E).
Bisset, John A., L.R.C.P. & S. 1898 (S).
Blackburn, James, L.R.C.P. & S. 1916 (S).
Blackley, David, M.B. 1904 (S).
Blair, Mrs. Nalini H., L.S.A. 1899 (E).
Blaker, Walter C., L.S.A. 1870 (E).
Blanchard, Nicholas, L.R.C.P. & S. 1901 (S).
Blanchard, Robert J., M.B. 1877 (S).
Bloom, Arthur, *M.C.*, M.B. 1911 (S).
Blott, Herbert, L.S.A. 1877 (E).
Bluemel, Charles S., M.R.C.S. 1917 (E).
Boake, William, L.R.C.S. 1883 (I).
Boazman, William H., M.B. 1890 (S).
Boissiere, Jean F. de, M.B. 1886 (E).
Boltman, Robert F., M.B. 1918 (S).
Bomford, William H., L.R.C.P. 1908 (I).
Bond, Barnabas M., M.R.C.S. 1886 (E).
Booker, Charles G., L.R.C.P. & S. 1916 (S).
Booth, John H., M.R.C.S. 1883 (E).
Borrah, Indranarayam, L.R.C.P. & S. 1918 (S).
Borthwick, Ernest L., M.B. 1897 (S).
Borthwick, Fernichirst, M.B. 1904 (S).
Bourdillon, Lancelot G., *D.S.O.*, *M.C.*, M.R.C.S. 1912 (E).
Bowie, John T., M.B. 1911 (S).
Bowie, William A., M.B. 1912 (S).
Bowker, Richard R. P. S., L.S.A. 1900 (E).
Bowman, Reginald, M.B. 1885 (S).
Boxer, Ernest A., L.R.C.P. & S. 1899 (S).
Boyd, John A., M.B. 1907 (I).
Boyd, John Francis, M.R.C.S. 1905 (E).
Boyton, Arthur J. H., M.R.C.S. 1895 (E).
Brachman, David S., M.R.C.S. 1916 (E).
Braddon, William L., M.R.C.S. 1884 (E).
Brady, Patrick, L.R.C.P. & S. 1900 (S).
Bramley-Moore, John, L.M.S.S.A. 1909 (E).
Bratton, William, L.R.C.P. & S. 1894 (I).
Brennan, John J., M.B. 1891 (S).
Brereton-Barry, James, L.A.H. 1914 (I).
Breuer, Adam A., M.R.C.S. 1896 (E).
Brewis, Andrew S., *O.B.E.*, M.B. 1887 (E).
Bridge, Solomon D., L.R.C.P. & S. 1913 (S).
Bridgford, Miss May E., L.R.C.P. 1901 (I).
Bridgman, Roger O., M.R.C.S. 1912 (E).
Brinck, Miss Julia M., L.K.Q.C.P. 1886 (E).
Briscoe, Moses, L.R.C.P. 1917 (I).
Brock, John, M.R.C.S. 1896 (E).
Broderick, Simon, L.R.C.P. 1908 (I).
Broderick, Thomas F., L.R.C.P. 1918 (I).
Brodziak, Frank A. J., M.B. 1909 (E).
Bronte, Alexander, L.R.C.P. & S. 1893 (S).
Brooke-Pechell, Sir Aug. A., M.B. 1881 (S).
Brooks, Edward, M.B. 1888 (S).
Brooks, Edward C., L.R.C.P. & S. 1914 (S).
Brooks, Gertrude, M.B. 1911 (E).
Brooks, James H., L.S.A. 1853 (E).
Brown, Mrs. Charlotte R. H., L.R.C.P. & S. 1895 (E).
Brown, Joseph l'Oste, M.R.C.S. 1872 (E).
Brown, Robert L., L.R.C.P. & S. 1893 (S).
Brown, Walter S., M.R.C.S. 1888 (E).
Browne, Augustus J. A., L.R.C.S. 1881 (I).
Browne, Dodwell, M.B. 1896 (I).
Bruce, William, *O.B.E.*, M.B. 1911 (S).
Brunskill, William E., L.R.C.P. 1905 (I).
Bruwer, Hendrik, J. P., M.B. 1915 (S).
Brydon, Adam G., M.B. 1900 (S).
Bryson, Alexander C., *M.C.*, M.B. 1906 (E).
Buchanan, Henry M., *O.B.E.*, M.B. 1911 (S).
Buchanan, James S., M.B. 1890 (S).
Buchanan, William, M.B. 1885 (S).
Buck, Arthur H., M.R.C.S. 1892 (E).
Buck, John S., M.R.C.S. 1878 (E).
Budd, Herbert H., L.M.S.S.A. 1911 (E).
Bullis, William H., L.R.C.P. 1884 (S).
Bullmore, Charles C., L.R.C.P. & S. 1895 (E).
Buncle, Alexander, M.B., 1867 (S).
Burd, Edward L., M.R.C.S. 1885 (E).
Burge, Arthur M., L.R.C.P. & S. 1915 (S).
Burgess, Gregor, M.B. 1886 (S).
Burjorjee, Bhumonjee, N., M.B. 1909 (S).
Burns, Michael J., M.B. 1916 (I).
Burns, William, M.B. 1897 (S).
Burr, Edward, L.R.C.P. & S. 1900 (S).
Burr, William A., M.R.C.S. 1908 (E).
Burton-Brown, Frederick H., L.S.A. 1890 (E).
Burwood, Thomas W., L.R.C.P. 1870 (E)
Bury, George, M.R.C.S. 1857 (E).
Butler, Alban, L.R.C.S. 1884 (I).
Buttery, Harold R., M.R.C.S. 1917 (E).
Byrne, James P., M.R.C.S. 1867 (E).

Cade, Frederick, J. R., L.R.C.P. & S. 1898 (S).
Cagney, Patrick, *M.C.*, M.B. 1913 (I).
Cahir, John P., M.B. 1908 (I).
Caldwell, Charles W., L.R.C.P. & S. 1897 (I).
Cameron, Robert, M.B. 1898 (S).
Cameron, Robert M. F., M.R.C.S. 1903 (E).
Campbell, Mrs. Florence G., M.B. 1891 (E).
Campbell, George J., L.R.C.P. & S. 1900 (S).
Campbell, John A., L.R.C.P. & S. 1897 (S).
Campbell, Richard, M.D. 1880 (I).
Campbell, Richard A., L.R.C.P. & S. 1900 (I).
Campbell, Thomas V., M.B. 1888 (S).
Campiche, Paul, M.R.C.S. 1903 (E).
Carbery, Andrew R. D., *C.B.E.*, L.R.C.P. & S. 1891 (I).
Carey, John T., M.R.C.S. 1874 (E).
Carlisle, James, L.F.P.S. 1869 (I).

Carney, Philip, *M.C.*, M.B. 1914 (I).
Carpenter, William S., M.R.C.S. 1890 (E).
Carr-Harris, Ferguson, *D.S.O.*, *M.C.*, M.R.C.S. 1903 (E).
Carroll, John J., M.B. 1916 (E).
Carter, Gerald B., M.B. 1896 (I).
Carter, William J. B., M.R.C.S. 1888 (E).
Carthew, Morden, M.B. 1899 (E).
Castaneda, Tiburcio P., M.R.C.S. 1881 (E).
Castellain, John G., M.R.C.S. 1906 (E).
Catto, William, M.B. 1893 (S).
Catto, William R., M.B. 1904 (S).
Cave, Miss Joan K. S., M.R.C.S. 1920 (E).
Cawley, George, M.R.C.S. 1895 (E).
Cawston, Frederick G., M.R.C.S. 1909 (E).
Chaffey, Elswood, L.R.C.P. 1872 (S).
Chand, Diwan J., L.R.C.P. & S. 1911 (S).
Chapman, Arthur Palmer, L.R.C.P. & S. 1893 (E).
Chapple, Aubrey D., M.R.C.S. 1885 (E).
Chatfield, Herbert T., *M.C.*, M.B. 1914 (I).
Chatterjee, Basanta K., L.R.C.P. & S. 1900 (E).
Chen, Yun Y., M.B. 1916 (S).
Chenoy, Hormusji J., L.R.C.P. & S. 1906 (S).
Chisholm, Edwin, M.R.C.S. 1860 (E).
Chouler, Harold Gordon, L.R.C.P. & S. 1910 (S).
Christal, Charles H., L.R.C.P. & S. 1908 (I).
Christian, John G., M.R.C.S. 1869 (I).
Chrystal, Francis M., M.B. 1912 (S).
Chu, Ando H., M.B. 1916 (S).
Church, Hester M., M.R.C.S. 1916 (E).
Clancy, John, L.R.C.S. 1882 (I).
Clark, Sir James R. A., Bart., *C.B.*, *C.M.G.*, M.R.C.S. 1878 (E).
Clarke, Arthur E., M.R.C.S. 1887 (E).
Clarke, George S., M.R.C.S. 1888 (E).
Clarke, Henry M L.R.C.P. 1863 (I).
Clay, William R., M.R.C.S. 1886 (E).
Clayton, Geoffrey S., L.S.A. 1883 (E).
Clement, Antonio M., M.R.C.S. 1917 (E).
Clements, Francis H., M.B. 1892 (I).
Clinton, Samuel A., L.R.C.P. 1875 (E).
Clough, Miss Irene N., M.R.C.S. 1913 (E).
Clowes, Joseph S., M.R.C.S. 1877 (E).
Coates, Albert P., L.R.C.P. & S. 1889 (E).
Cochrane-Brown, Edith, M.B. 1903 (S).
Coetzee, Johannes C., M.B. 1920 (I).
Coetzee, Louis, M.B. 1902 (S).
Cogan, Denis, L.R.C.P. & S. 1911 (S).
Coghlan, Harold E., M.B. 1899 (E).
Cogswell, Philip D., M.R.C.S. 1898 (E).
Cohen, Algernon A., M.B. 1880 (E).
Colaco-Belmonte, Jacob A. B., L.R.C.P. & S. 1895 (S).
Cole, William A., L.R.C.P. & S. 1901 (S).
Collie, Frank L., M.B. 1886 (S).
Collier, Henry N., L.S.A. 1903 (E).
Collingwood, Bertram J., *O.B.E.*, M.B. 1900 (E).
Collins, Geoffrey, L.R.C.P. & S. 1908 (I).
Coman, John J., L.R.C.P. & S. 1918 (I).
Compton, Thomas A., M.R.C.S. 1864 (E).
Conlon, Peter J., M.B. 1917 (I).
Conry, John, L.K.Q.C.P. 1868 (I).
Constable, Miss Evelyn A., M.B. 1912 (E).
Constantian, Raphael A. C., M.B. 1893 (S).
Conway, James, L.R.C.P. & S. 1899 (I).
Conyngham, Henry F., L.R.C.P. & S. 1896 (I).
Cook, Alan G., M.B. 1904 (E).
Coombe, Ethelbert E. S., M.B. 1889 (E).
Coomber, Arthur B., M.R.C.S. 1907 (E).
Cooper, Charles, L.R.C.P. & S. 1905 (I).
Cooper, Dossabhoy N., M.R.C.S. 1892 (E).
Cooper, Kaikhusroo D., L.R.C.P. & S. 1901 (S).
Cooper, Miss Lilian V., L.R.C.P. & S. 1890 (E).
Corbett, Michael, L.R.C.P. 1872 (I).
Corbett, William J., L.R.C.P. & S. 1891 (I).
Corcoran, Patrick J., M.B. 1914 (I).
Corke, Cecil A., L.S.A. 1879 (E).
Cormick, George, L.R.C.P. & S. 1888 (E).
Cornish, Charles N., M.R.C.S. 1881 (E).
Coronel, Julius, M.R.C.S. 1884 (E).
Cory, Frank G., M.R.C.S. 1889 (E).
Cory, Harold M., M.R.C.S. 1901 (E).
Coskey, Alexander P., M.B. 1902 (S).
Cottew, Arthur A., L.R.C.S. 1882 (I).
Cottin, Henrique A., L.M.S.S.A. 1915 (E).
Coventry, Charles, M.B. 1896 (E).
Coverdton, Hugh S., M.R.C.S. 1891 (E).
Coward, Ernest G., M.B. 1886 (E).
Cowen, Charles E., L.R.C.P. & S. 1893 (I).
Cowen, Herbert O., M.B. 1888 (S).
Cowper, Alfred, M.B. 1894 (S).
Cox, William L., L.S.A. 1876 (E).
Coy, William F., M.R.C.S. 1887 (E).
Coyle, Edward, L.S.A. 1883 (E).
Craig, Stanley D., M.B. 1912 (S).
Craig, William B., *D.S.O.*, M.B. 1894 (S).
Craighead, Alexander C., M.B. 1914 (S).
Crawford, John S., M.B. 1910 (I).
Crawford, Stephen E., M.R.C.S. 1905 (E).
Crawshaw, James H., L.S.A. 1896 (E).
Creagh, William, L.R.C.S. 1857 (E).
Crean, Thomas J., *V.C.*, *D.S.O.*, L.R.C.P. & S. 1896 (I).
Crease, James R., L.R.C.P. & S. 1894 (S).
Creyk, William, M.B. 1860 (E).
Cripps, Francis Roy, M.B. 1916 (S).
Croly, Arthur H., L.R.C.P. & S. 1911 (I).
Crombie, David, L.R.C.P. & S. 1900 (S).
Crooke, Thomas L., L.R.C.P. 1883 (S).
Crookshank, Edgar M., M.R.C.S. 1881 (E).
Crosby, Arthur H. P., M.R.C.S. 1895 (E).
Cross, Miss Cornelia J. J., M.B. 1920 (S).
Cross, William J., L.R.C.P. 1880 (S).
Crosse, Walter, L.R.C.P. & S. 1910 (S).
Crossle, Francis E., M.B. 1911 (I).
Crowe, John J., L.A.H. 1919 (I).
Crowe, Patrick V. F., L.R.C.P. & S. 1912 (I).
Crowther, Edward L., M.R.C.S. 1866 (E).
Culbertson, Robert, L.R.C.P. & S. 1901 (S).
Cummings, Richard H. La B., L.R.C.P. & S. 1907 (S).
Cunningham, Miss Frances, L.M.S.S.A. 1908 (E).
Cuppage, Burke, M.B. 1915 (I).
Currie, Oswald J., M.R.C.S. 1881 (E).
Cusack, Bernard A., M.B. 1915 (I).
Cuthbertson, John O., M.B. 1901 (E).

Dadachanji, Edalji R., L.S.A. 1880 (E).
Dalal, Muljibhai K., L.R.C.P. & S. 1914 (S).
Dalgado, Patrick, M.R.C.S. 1898 (E).
Daly, Frederick J. P., M.R.C.S. 1899 (E).
Daly, James T., M.R.C.S. 1909 (E).
Daly, Ramsay L., M.B. 1891 (E).
Daly, Ulick A., M.B. 1878 (I).
Dalziel, William, L.R.C.P. 1879 (E).
D'Amico, Guido de P., M.R.C.S. 1908 (E).
Dansey, George F., M.R.C.S. 1852 (E).
Dantra, Dhunjeeshaw H., L.R.C.P. & S. 1894 (E).
Dardenne, Henri, M.B. 1889 (E).
D'Arifat, Andre C. de L., M.R.C.S. 1913 (E).
Darwent, Claude T., L.R.C.P. & S. 1915 (S).
David, Jesudason S., L.R.C.P. & S. 1915 (S).
David, Sebastian E., L.A.H. 1909 (I).
Davidson, David McD., *C.I.E.*, M.B. 1887 (E).
Davidson, James, M.B. 1911 (S).
Davidson, John, L.R.C.P. & S. 1879 (S).
Davies, Henry, M.B. 1895 (S).
Davies, Lucy E., M.B. 1910 (S).
Davies, William M., L.R.C.P. 1872 (S).
Davies, Wm. T. F., *C.M.G.*, *D.S.O.*, M.R.C.S. 1882 (E).
Davin, Alfred L. V., M.B. 1916 (S).
Davis, Charles N., M.R.C.S. 1903 (E).
Davis, Frederick H., L.S.A. 1876 (E).
Davison, Neville H., M.B. 1918 (E).
Dawes, Adolf H. C., L.M.S.S.A. 1910 (E).
Dawson, Thomas, L.R.C.P. & S. 1893 (S).
Dawson, Henry T., M.B. 1892 (S).
Dawson, William H., M.B. 1898 (S).
Deane, Arthur M., M.B. 1904 (E).
Deane, John H., L.R.C.P. 1881 (S).
Deans, John, M.R.C.S. 1862 (E).
Deck, Horace L., M.R.C.S. 1906 (E).
de Costa, Marcelline, M.R.C.S. 1914 (E).
Dedrickson, Robert F., L.R.C.P. 1877 (I).
De Lacy, Robert C., M.B. 1895 (E).
Delamotte, George C., M.R.C.S. 1862 (E).
De Leon, John, M.R.C.S. 1861 (E).
Demary, Andrew F., L.R.C.P. & S. 1905 (S).
Demech, Philip, M.D. 1856 (E).
Demerdash, Mahmond A. B., M.R.C.S. 1917 (E).
Dempster, Harold W., M.B. 1907 (S).
Dennis, Arthur W., M.R.C.S. 1914 (E).
Denton-Fethers, Percy, L.R.C.P. & S. 1893 (E).
Derkson, Cornelius H., M.B. 1907 (S).
Desai, Narayan K., L.R.C.P. & S. 1905 (I).
de Silva, Christopher I., M.B. 1916 (E).
Devereux, Arthur C., M.B. 1903 (S).
de Villiers, Jacob I., M.B. 1916 (S).
Dewar, Alexander, L.S.A. 1902 (E).
de Wardt, Mrs. Iris, L.M.S.S.A. 1918 (E).
Dewhirst, Wilfred A., M.B. 1897 (E).
Dey, Kshirendra M., M.B. 1917 (S).
Dey, Nalini N., L.R.C.P. & S. 1902 (S).
Dhairyawan, Krishnarao G., L.R.C.P. & S. 1908 (S).
Dias, Charles W., M.R.C.S. 1915 (E).
Dick, Carl K. G., *M.C.*, M.R.C.S. 1914 (E).
Dick, William, L.R.C.P. & S. 1904 (S).
Dickey, Hugh J., M.B. 1892 (I).
Dickey, Samuel, M.D. 1879 (E).
Dickey, Thomas, M.B. 1919 (I).
Dickey, Wm. C. McN., M.R.C.S. 1907 (E).
Dickson, John William, M.R.C.S. 1890 (E).
Dickson, Joseph S., L.R.C.P. & S. 1915 (S).
Dickson, Thomas A., L.R.C.S. 1881 (S).
Dillon, Henry V., L.R.C.S. 1881 (I).
Dillon, William, L.R.C.S. 1884 (I).
Dina, Ahmad R. K., M.R.C.S. 1919 (E).
Dissent, Miss F. H., L.R.C.P. & S. 1894 (E).
Dive, Hubert R., *M.C.*, M.R.C.S. 1913 (E).
Dixon, Alban, M.R.C.S. 1908 (E).
Dixon, Charles W., M.B. 1914 (E).
Docherty, Peter A., L.R.C.P. & S. 1890 (S).
Dockrell, Maurice, L.R.C.P. 1917 (I).
Dodds, Mary J., *O.B.E.*, L.R.C.P. & S. 1895 (S).
Dods, Archibald, L.R.C.P. & S. 1900 (S).
Doherty, Edmond, M.B. 1915 (I).
Donnellan, John A., M.B. 1909 (E).
Donoghue, John, L.R.C.P. 1909 (I).
Donovan, Daniel M., L.R.C.P. & S. 1904 (S).
Donovan, Thomas M., L.R.C.P. & S. 1896 (S).
Dooley, Miss Annie, M.B. 1916 (I).
Dorland, Solomon M., L.R.C.P. 1884 (S).
Douglas, John C., M.B. 1871 (S).
Dowley, Thomas P., M.B. 1908 (I).
Dowling, George W., M.R.C.S. 1890 (E).
Downes, James B., M.R.C.S. 1862 (E).
Dowzer, Thomas, *M.C.*, L.R.C.P. 1912 (I).
Doyle, Andrew A., L.R.C.S. 1884 (I).
Drew, Francis C., M.B. 1902 (S).
Drew, Hedley V., M.R.C.S. 1882 (E).
Drew, John M., M.B. 1911 (S).
Driver, Henry L., M.R.C.S. 1902 (E).
Drummond, James H. G., L.R.C.P. 1876 (E).
Drummond, John, M.B. 1910 (S).
Drummond, Maurice, L.R.C.P. 1910 (I).
Duane, Thomas J., M.B. 1919 (I).
Dudgeon, Christopher R., *M.C.*, M.R.C.S. 1912 (E).
Dudley, Bernard J., M.R.C.S. 1901 (E).
Duff, Thomas, L.R.C.P. & S. 1900 (S).
Dufton, Miss Marjory J., M.B. 1918 (S).
Duggan, Cornelius, M.B. 1917 (E).
Duggle, Richard I., L.R.C.P. & S. 1919 (S).
Duguid, William N., M.B. 1920 (S).
Duncan, Horace, M.R.C.S. 1887 (E).
Duncan, James F., M.B. 1902 (S).
Duncan, Robert, M.B. 1920 (I).
Duncombe, Charles E. B., L.R.C.P. 1883 (E).
Dundon, Edward, L.R.C.P. 1909 (I).
Dunlop, Albert, L.R.C.P. 1879 (I).
Dunn, Spencer S., M.B. 1888 (E).
Dunnet, Henry W., L.R.C.P. & S. 1912 (S).
Dunstone, Leonard J., M.B. 1907 (E).
Durdin, Robert C. G., L.R.C.S. 1879 (I).
Durell, Robert E., M.R.C.S. 1893 (E).
Durrant, Charles E., M.R.C.S. 1896 (E).
Duthie, James F., M.B. 1916 (S).
du Toit, Thomas A., L.R.C.P. & S. 1920 (S).
Dwyer, Joseph B., L.R.C.P. 1917 (I).
Dwyer, Pierce M., L.R.C.P. & S. 1890 (I).
Dyas, Albert E., L.K.Q.C.P. 1887 (I).
Dyer, James A., L.R.C.P. 1875 (S).
Dyk, Cornelius G. L. van, M.B. 1918 (S).
Dyke, Kenneth H., M.B. 1917 (S).

East, Edwin C., M.R.C.S. 1910 (E).
Eaves, James, M.B. 1910 (S).
Eder, Montague D., M.R.C.S. 1895 (E).
Edey, Thomas H., M.R.C.S. 1915 (E).
Edmond, William R., M.R.C.S. 1875 (S).
Edwards, Charles A., L.S.A. 1883 (E).
Eede, Eli, T., L.R.C.P. 1884 (E).
Eldrid, Mrs. Elsie R. C., L.R.C.P. & S. 1899 (S).
Elias, Peter, L.S.A. 1904 (E).
Elliott, Adam G., L.R.C.P. 1884 (S).
Elliott, Thomas W. E., M.B. 1915 (I).
Ellis, Austin D., M.B. 1888 (S).
Ellis, John C., M.R.C.S. 1911 (E).
Ellis, Vincent C., M.B. 1916 (I).
Eloff, Johan S., M.R.C.S. 1917 (E).
Elwood, John R., L.A.H. 1915 (I).
Emrys-Jones, Mansel F., L.M.S.S.A. 1907 (E).
Enslin, Johannes S., M.B. 1900 (S).
Erulkar, Abraham S., M.B. 1913 (E).
Esler, Alexander R., M.R.C.S. 1913 (E).
Esler, Alfred William, M.D. 1887 (I).
Etheridge, Charles E., M.R.C.S. 1899 (E).
Evans, David T., M.R.C.S. 1915 (E).
Evans, John, L.A.H. 1874 (I).
Evans, Leonard W., M.R.C.S. 1916 (E).
Evans, Owen G., L.R.C.P. & S. 1916 (S).
Evans, Thomas, M.B. 1899 (E).
Evans, William G., L.R.C.P. 1884 (S).
Everest, Clare A., L.R.C.P. 1881 (E).
Ewart, James C., M.B. 1874 (S).
Ewart, John, M.B. 1880 (S).
Ewart, William, M.B. 1899 (S).
Ewens, Bernard C., M.R.C.S. 1912 (E).
Ewing, Samuel A., L.R.C.P. & S. 1889 (E).

Fahmy, Moustafa, M.R.C.S. 1915 (E).

Fallon, Robert H., M.B. 1881 (E).
Farag, Mounir, M.R.C.S. 1915 (E).
Farley, George W., M.B. 1891 (I).
Farncomb, Alfred, L.R.C.P. 1884 (S).
Farnum, Charles M. S., M.R.C.S. 1894 (E).
Farquhar, Alexander, M.B. 1915 (S).
Farr, Arthur J., M.R.C.S. 1866 (E).
Farrell, Michael A., M.B. 1920 (I).
Faruqi, Shaikh M. A., M.B. 1917 (E).
Faulkner, Ebenezer R., M.R.C.S. 1905 (E).
Faulkner, William C., M.B. 1885 (E).
Fehrsen, Guy, M.R.C.S. 1916 (E).
Felix, Jean J. T. R., M.B. 1904 (E).
Fennelly, Martin, L.K.Q.C.P. 1884 (I).
Fenwick, George E. O., *O.B.E.*, M.R.C.S. 1903 (E).
Ferguson, John, L.R.C.P. 1880 (S).
Ferguson, Mary M. G., M.B. 1916 (S).
Ferriere, Joseph A., M.B. 1904 (E).
Fetherstonhaugh, Robert T., M.R.C.S. 1885 (E).
Field, Corelli C., L.R.C.P. & S. 1896 (S).
Field-Martell, Harold H., L.R.C.P. & S. 1909 (S).
Fielder, Sidney, L.K.Q.C.P. 1889 (E).
Findlay, Aubrey G. C., L.S.A. 1905 (E).
Finlay, Sinclair, L.R.C.S. 1883 (I).
Fisher, Arthur G., *M.C.*, M.B. 1915 (I).
Fisher, Francis C., L.R.C.P. & S. 1877 (I).
Fisher, Reginald W., M.R.C.S. 1894 (E).
Fisher, Richard D., M.R.C.S. 1896 (E).
Fisher, Thomas C., M.B. 1875 (I).
Fitchett, Francis W. B., M.B. 1895 (S).
Fitzgerald, Daniel A., M.B. 1919 (I).
Fitzgerald, James J., M.B. 1893 (I).
Fitzgerald, Richard, L.R.C.P. & S. 1890 (S).
Fitzgerald, William, M.B. 1895 (S).
Fitzpatrick, Jas. P., L.R.C.P. & S. 1913 (I).
Fitzwilliams, G. H. L., M.B. 1904 (S).
Fleming, George, M.B. 1915 (S).
Fleming, Joseph, L.R.C.P. & S. 1895 (I).
Fleming, Mrs. Muriel K., M.B. 1915 (S).
Fleming, Samuel, M.B. 1890 (S).
Flemyng, Geo. G., M.D. 1894 (I).
Fletcher, James, M.B. 1895 (E).
Fletcher, James H., *D.S.O.*, *M.C.*, L.Med.L.S. 1914 (I).
Fletcher, Jas. O'F., M.R.C.S. 1920 (E).
Flide, Charles M., M.B. 1888 (E).
Flinn, David E., L.R.C.S. 1873 (I).
Flint, Harold E., M.R.C.S. 1907 (E).
Flood, Edward F., L.A.H. 1884 (I).
Flood, Edward S., M.B. 1919 (I).
Flood, James J., M.B. 1907 (I).
Flood, John W., M.B. 1909 (I).
Floyer, Blaixe B., M.R.C.S. 1872 (E).
Flynn, Denis J., M.D. 1886 (I).
Flynn, John, M.B. 1885 (I).
Foley, Bryan, L.R.C.P. & S. 1907 (I).
Fonmartin, Henry de, L.S.A. 1875 (E).
Fooks, Edward V. R., M.R.C.S. 1894 (E).
Fooks, George E., M.R.C.S. 1879 (E).
Foot, Ernest G., L.S.A. 1883 (E).
Foote, Herbert J., M.B. 1915 (S).
Forbes, Alexander K., *M.C.*, M.B. 1912 (S).
Forbes, Arthur L. A., L.R.C.P. 1870 (E).
Forbes, John C., L.R.C.P. 1895 (S).
Forrester, William R., M.B. 1887 (S).
Forsyth, John M., *M.C.*, *D.S.O.*, M.B. 1912 (S).
Foster, Archibald L., L.R.C.P. & S. 1897 (S).
Fourie, Louis, M.B. 1904 (S).
Fowler, William M., M.B. 1893 (S).
Fox, Arthur C. L., L.R.C.P. 1900 (S).
Fox, Cornelius B., M.R.C.S. 1863 (E).
Fox, Robert A., M.B. 1893 (S).
Francis, Reginald C. H., M.R.C.S. 1909 (E).
Francois, Charles A., L.R.C.P. & S. 1895 (S).
Fraser, Alexander R., M.B. 1882 (S).
Fraser, Alexander T., B.C. 1900 (E).
Fraser, Archibald C., M.D. 1879 (I).
Fraser, George M., M.B. 1908 (S).
Fraser, Lizzie T., M.B. 1900 (S).
Frazer, Peter T., L.R.C.P. & S. 1867 (I).
Freeman, Frank P., *M.C.*, L.A.H. 1914 (I).
Freer, Edward L., M.R.C.S. 1877 (E).
Freeze, Edwin H., L.R.C.P. & S. 1904 (S).
Freyer, Patrick William, M.B. 1906 (S).
Friedlander, Arthur J., M.R.C.S. 1909 (E).
Frost, Walter, M.R.C.S. 1863 (E).
Fry, William B., M.B. 1881 (E).
Fryer, George E., *O.B.E.*, M.R.C.S. 1888 (E).
Fulss, Frederick C. J., M.B. 1888 (S).
Fulton, Jane McC., M.B. 1907 (I).
Fulton, Robert V., M.B. 1889 (E).
Fulton, Thomas F. S., M.B. 1912 (I).
Fulton, William, M.B. 1892 (S).

Gabriel, William M., L.R.C.P. & S. 1887 (S).
Gaffney, Charles B., L.R.C.S. 1879 (I).
Galloway, David J., M.B. 1884 (S).
Galvin, John S., M.B. 1916 (S).
Gamble, Leonard D., M.B. 1886 (I).
Garde, Godfrey E., L.R.C.P. 1885 (S).
Garde, Henry C., L.A.H. 1877 (I).
Garland, Albert L., M.R.C.S. 1874 (E).
Gault, David, L.R.C.P. 1880 (I).
Gauntlett, Eric G., *C.B.E.*, *D.S.O.*, M.R.C.S. 1908 (E).
Gentle, David, M.D. 1865 (S).
Gentles, Mrs. Lisette A. M., M.B. 1905 (S).
Geohegan, Francis M., M.D. 1876 (I).
George, Thomas W., M.B. 1910 (E).
Gerson, Herman M., M.R.C.S. 1919 (E).
Ghosh, Abani M., M.B. 1915 (E).
Ghosh, Bharat C., L.R.C.P. & S. 1893 (S).
Ghosh, Sourendra M., M.R.C.S. 1914 (E).
Gibbes, John M., M.R.C.S. 1865 (E).
Gibbons, John F., L.R.C.P. 1910 (I).
Gibbs, Norman E., L.R.C.P. & S. 1901 (S).
Gibson, Colin C. G., M.R.C.S. 1915 (E).
Giffard, Douglas W., M.R.C.S. 1871 (E).
Gilbert, Charles W., M.R.C.S. 1892 (E).
Gilbert, John, L.R.C.S. 1891 (I).
Gilbertson, William, M.R.C.S. 1897 (E).
Gill, George F., M.R.C.S. 1902 (E).
Gillespie, James, L.R.C.S. 1861 (I).
Gillespie, James, M.B. 1892 (S).
Gillies, Hugh C., M.B. 1882 (E).
Gilmer, Hamilton, A. H., M.B. 1899 (S).
Gilmour, William M., M.B. 1905 (S).
Gilroy, Robert C., M.B. 1885 (S).
Girdwood, William, M.B. 1900 (S).
Girgis, Aziz, M.R.C.S. 1917 (E).
Glaister, Joseph, M.B. 1905 (S).
Glanville, Ruby E., M.B. 1905 (E).
Glassford, Ian C. G., *M.C.*, M.R.C.S. 1902 (S).
Gleeson, Daniel, M.B. 1904 (I).
Gleeson, Frank H., L.R.C.P. & S. 1909 (I).
Gluckman, Henry, M.R.C.S. 1917 (E).
Glynn, John J., L.R.C.P. & S. 1913 (I).
Glynn, Patrick D., L.R.C.P. & S. 1897 (I).
Godfrey, Clarence G., L.R.C.P. & S. 1889 (E).
Gokhale, Vaman G., L.R.C.P. & S. 1909 (E).
Goldsmith, Bridson K., M.B. 1899 (S).
Golland, Alfred, M.R.C.S. 1877 (E).
Goldstein, John L., M.R.C.S. 1903 (E).
Goems, Antonio S., M.R.C.S. 1867 (E).
Gonin, Bertram W., M.R.C.S. 1902 (E).
Gonsalvez, Daniel R., L.R.C.P. & S. 1902 (E).
Good, James W., L.R.C.P. 1877 (S).
Good, Joseph E., M.B. 1894 (S).
Goodchild, John F., M.R.C.S. 1904 (S).
Goodchild, Thomas A., L.R.C.P. & S. 1889 (I).
Goode, George E., M.R.C.S. 1900 (E).
Goode, Matthew E., M.B. 1910 (E).
Goodman, Henry C., *C.B.E.*, M.R.C.S. 1894 (E).
Goodman, Hyam, M.B. 1899 (S).
Goonetilleke, Frederick W., M.R.C.S. 1904 (E).
Goraksbakar, Vinayak R., M.B. 1904 (S).
Gordon, Charles N., M.B. 1920 (S).
Gordon, George A. C., *M.C.*, M.B. 1914 (S).
Gorrie, Peter, M.B. 1908 (S).
Goss, Walter E., M.B. 1909 (S)
Gould, Charles H., M.R.C.S. 1913 (E).
Goulden, Edmund A., M.B. 1893 (E).
Govindu Rajulu, Miss Rose, *M.B.E.*, L.R.C.P. & S. 1895 (I).
Gow, Peter, M.R.C.S. 1903 (E).
Gowans, William H., M.B. 1906 (S).
Grace, Jeremiah, L.R.C.P. & S. 1906 (I).
Graham, Miss Alice M., M.B. 1919 (S).
Graham, George R. M., L.K.Q.C.P. 1883 (E).
Graham, George W., L.R.C.P. 1871 (E).
Graham, James D., L.R.C.P. & S. 1897 (S).
Graham, Lionel A. J., L.M.S.S.A. 1915 (E).
Graham, Lorne B., M.R.C.S. 1918 (E).
Graham, Miss Mildred E., L.R.C.P. & S. 1897 (E).
Graham, Roland H., M.B. 1915 (I).
Graham, Vyner, M.R.C.S. 1896 (E).
Graham, Walter R., L.R.C.P. & S. 1898 (S).
Grant, Robert, M.B. 1867 (S).
Grantham-Hill, Clermont, M.R.C.S. 1918 (E).
Graves, Robert K. G., M.R.C.S. 1904 (E).
Gray, Miss Elizabeth, M.B. 1915 (S).
Gray, Francis A., L.R.C.P. & S. 1902 (S).
Gray, Robert W., M.B. 1892 (S).
Green, Edwin A. T., *M.C.*, M.R.C.S. 1915 (E).
Green, Thomas H., M.R.C.S. 1864 (E).
Greene, Arthur P., L.R.C.P. 1870 (I).
Greene, John S., L.R.C.S. 1863 (I).
Gregg, James, M.B. 1896 (I).
Gregory, Alfred J., *O.B.E.*, M.R.C.S. 1886 (E).
Gregory, Thomas, M.R.C.S. 1896 (E).
Grenfell, Pascoe B., M.R.C.S. 1899 (E).
Grenfell, Wilfred T., *C.M.G.*, M.R.C.S. 1888 (E).
Greval, Shiva D. S., M.B. 1917 (E).
Greville, Ernest R. G., M.R.C.S. 1914 (E).
Grey, Robert, M.B. 1914 (S).
Grieve, Alexander N., M.B. 1886 (S).
Griffin, Gerald, M.R.C.S. 1902 (E).
Griffin, Montague L., M.B. 1892 (I).
Griffith, James de B., M.B. 1874 (I).
Grogan, Patrick J., M.B. 1908 (I).
Guilfoyle, John M., M.B. 1915 (E).
Gunn, Miss Elizabeth C., M.B. 1903 (S).
Gunn, Michael B., L.R.C.P. & S. 1917 (I).
Gunn, Roderick McK., M.B. 1906 (S).
Gunne, John R., M.R.C.S. 1906 (E).
Gunson, Edward B., M.B. 1910 (S).
Guthrie, Harry A. L., L.R.C.P. & S. 1915 (S).
Guthrie, John, M.B. 1874 (S).
Guthrie, John, M.B. 1902 (S).
Gwynne, George, L.R.C.S. 1874 (I).

MEDICAL PRACTICE AS IT IS TO-DAY:
CONDITIONS IN AN AGRICULTURAL DISTRICT.

(FROM AN OCCASIONAL CORRESPONDENT.)

IT may be premised that country medical practice, and especially contract practice, differs in essential details from the same class of practice in industrial centres or in any thickly populated area. The urban practitioner has at hand facilities denied to the country practitioner. In a case of injury or serious illness or of difficult diagnosis the patient can be sent to a hospital and the practitioner largely relieved of responsibility. Ability to take this course is to the advantage of the doctor and greatly to the advantage of the patient, although under present circumstances not beneficial to the hospital. It was pointed out by Sir Napier Burnett, in a report on the financial position of voluntary hospitals in England and Wales (excluding London), that during the year 1920 the total sum received by these hospitals for services rendered to insured patients was only £39,000. Many country hospitals feel this position keenly; a typical complaint from an annual report runs as follows: "Twenty-six per cent. of the out-patients are insured persons who make weekly contributions to the National Health Insurance scheme but from which the hospital receives no support whatever." If this large proportion of out-patients is sent to the hospital by the panel doctor as requiring special diagnosis and treatment, the hospital obviously has a claim for recompense by the approved societies. But if, on the other hand, these patients come to the hospital on their own initiative without the sanction of their medical attendant, why should they be received when financial arrangements are made under the Act for their treatment? Such hospital abuse applies but little to rural panel practice.

Inquiries made in a typical agricultural county brought out some suggestive points. Facilities for pathological investigations were regarded as satisfactory. Specimens to be examined are sent to the

county laboratory, where investigations are made gratuitously. There are no facilities for X raying fractures in the purely agricultural districts, although a cottage hospital on the edge of the county has an excellent apparatus. As to the provision of a portable X ray apparatus attached to some convenient centre to be telephoned for by the practitioner opinion varied: one thought the suggestion useful, another held it inadvisable on account of expense and because it requires an expert correctly to interpret X ray pictures, a third doubted whether there would be enough cases where the patients could not be moved to make the provision worth while. Consensus of opinion seemed to be against the provision of a portable installation.

Most of the practitioners with whom I spoke were satisfied with the conditions of panel practice and with the present capitation fee, but this they felt should be regarded as a minimum. Panel practice is liked better by far than the old club system. The main objection raised against it in this county is the amount of clerical work to be done. The rural practitioner is not often able to engage a dispenser or secretary to keep his books for him. He has to drive long distances each day, to conduct two surgeries a day, to make up his own physic, and maybe sit up half the night with a difficult confinement. Under these conditions he naturally develops a distaste for keeping records; indeed, this may be one principal reason why they are carelessly kept, the other being the fact that a rural practice fluctuates but little and his clinical records are mostly for himself alone. One practitioner, however, assured me that the panel system tended to lower the dignity of the profession and to sap the independence of the practitioner. He went on to say that a time was not far distant when the medical man would be at the beck and call of the Approved Societies who wielded political influence while the medical profession was relatively impotent. There seemed to be a general recognition that the present trend was towards a radical change in the nature of medical practice which, instead of being curative and remedial, was becoming chiefly preventive. This, it was felt, meant progress, but there was an undercurrent of fear lest the medical man, under the particular conditions that might prevail, would be less his own master than formerly.

The majority of rural panel practitioners appeared to be envious of the lot of their confrères in the same class of urban practice. The mileage grant is still felt to be inadequate. The urban practitioner can do his round on foot or on bicycle, while the country doctor has to keep a car even if his returns prove it an unwarrantable expense. The lack of opportunity to get a second opinion in difficult medical cases is often tiresome. Infant welfare and antenatal clinics are unknown in the rural parts of the county, and, speaking generally, I did not find practitioners taking a keen interest in this branch of preventive work. Although a considerable proportion of confinements took place in unsuitable surroundings the mortality in childbirth was seen to compare favourably with that in urban and industrial centres. The doctors told me that maternity homes would not be used by the women, who are deeply conservative in the county, viewing any innovations with distrust. Moreover, they were not much needed in many parts of the county which were well provided with district nurses. Agreement was general that midwives should be better paid for maternity work.

HASLAR HOSPITAL MEMORIAL.—A memorial tablet containing over 200 names of medical officers and nursing sisters of the Royal Navy who were killed or died on active service in the war, was unveiled by the Medical Director-General, Sir Robert Hill, K.C.B., on August 17th, in the presence of a large gathering. It is appropriately placed in the gateway of the hospital, through which pass every naval surgeon and nursing probationer, who would be reminded of the sacrifices of those who gave their all for King and Country. The tablet is one of three to be erected; the others will be at Chatham and Plymouth.

LONDON WATER-SUPPLY.

ANNUAL REPORT OF THE METROPOLITAN WATER BOARD.

Sir Alexander Houston's sixteenth annual report,[1] as director of water examinations to the Metropolitan Water Board, contains the results of analyses carried out during the year ended March 31st, 1922, along with other information of interest to sanitarians.

Chlorination in Actual Practice.

Thames.—It is now the practice to keep the Staines reservoirs full of water as a reserve against drought and, except during floods, to gravitate chlorinated river water to the extent of 70–80 million gallons a day down the Staines aqueduct. The difference between the cost of the coal for pumping water into the reservoirs and the cost of the chemical for chlorination treatment amounted during the year to a saving of over £21,000. There have been no complaints as regards taste and, although storage purifies water bacteriologically to a marked extent, even better results have been obtained by chlorination.

New River.—Here is apparently a diametrically opposite state of affairs. Owing to inadequate storage and filtration area, the New River deteriorates during the flood months of the year, and it is then—unlike the case of the Thames—that chlorination is practised. All taste troubles here also have been eliminated.

Chelsea.—This was an emergency treatment consequent upon the opening of the old Chelsea intake at Surbiton, in order somewhat to relieve the draught on the River Thames in its higher reaches. The results appear to have been successful, for the water as supplied to consumers was actually better than normal. When it is remembered that ordinarily the Chelsea filters deal with water which has been stored for a long time, and that during the period of treatment the same filters had to cope with raw river water in the neighbourhood of Surbiton, the results are the more remarkable. The water was chlorinated after filtration and sometimes permanganate was added.

Deptford Well.—A striking state of affairs is revealed in this section. The well water treated with minute doses (0·25 in 1 million) of chlorine gave rise to taste troubles, which could not be surmounted by the concurrent use of permanganate without imparting a pink tinge to the water. The bold step was taken of increasing the dose four-fold (1 in 1 million) and dechlorinating with sulphurous acid gas. The results were completely successful, and it would now appear that questions of taste in connexion with chlorination may be completely obviated by successive super- and de-chlorination methods.

The Future of Chlorination.

The report deals successively with the doping of water, questions of taste, and short-cuts to purity. The advantages of chlorination are considered under the headings of: Saving pumping charges, adverse weather conditions, sources of supply, occasional uses, local treatment, and economical considerations. As the report states, the purification of water is as old as the hills, but it still possesses unexhausted fields of possibilities. Chlorination may not be the ultimate goal, but it is one of the avenues which merits exploration, and even if it is regarded as only a temporary measure it may be the means of tiding us safely, as well as economically, through a period of unparalleled financial stringency.

Another section sets out the methods of administering chlorine to water. A diagram is appended of a bleach plant showing all the essentials without unnecessary and confusing detail.

Other Difficulties Surmounted.

An interesting description is given of a curious and rather disconcerting visitation at the New River Works. During May, 1921, a harmless green growth of a protococcus-like nature developed in the water.

[1] London: P. S. King and Son, Ltd. 65 pp. Price 10*s*.

and for some reason, as yet unascertained, the green cells largely escaped the filtration barrier and passed into the supply.

Since November, 1920, the suspended solids in Thames river water have been determined gravimetrically once a week on a mixture of samples collected daily. During the year under review the suspended solids were, as might have been expected from the abnormally low rainfall, very slight in amount. During the week ended March 12th, however, every million gallons of raw Thames water carried with it 616 lb. (5½ cwt.) by weight of suspended matters, 496 lb. (or nearly 4½ cwt.) of which were non-volatile. It is evident that there are periods when the river water contains so much suspended matter that the temporary closing of the intakes is strongly indicated.

A small experimental plant for rapid filtration has been put in at Staines, and this gives hope for the future. On a small scale the system of filtration has worked at 200 gallons per square foot per hour for the rapid, and at 10 gallons for the secondary semi-rapid filter without apparently seriously curtailing the life of the latter, while the final filtrate passed the chemical, bacteriological, and physical standards. Should this hold on a big scale the saving would be so material as to far more than pay for any additional methods of purification—e.g., chlorination—which the dictates of prudence might suggest.

The Avoidance of Accidents.

In concluding his report Sir Alexander Houston again utters a word of warning on the question of "accident." If the true history of all past water epidemics could be learnt, he believes that in nearly all cases something in the nature of an accidental circumstance would be found to be the explanation. In many cases the occurrence would be found not wholly divorced from lack of forethought, or breach of common-sense precautions, even if the charge of culpable negligence were not admissible. The practically hopeless position of the expert in discovering these hidden dangers has been explained on previous occasions. The remedy, Sir Alexander Houston is sure, lies in the avoidance of any new factor in waterworks procedure which does not bear the hall-mark of epidemiological approval, and in so safeguarding the finally purified water that the entrance of any adventitious water into the supply is absolutely impossible.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Food Poisoning Outbreak at Loch Maree.

THE Scottish Board of Health has received a report drawn up by Dr. F. Dittmar and Dr. G. R. Leighton on the lamentable outbreak of food poisoning. No reasonable doubt is entertained that the eight deaths at the Loch Maree Hotel were due to potted meat or paste containing the toxin produced by the *Bacillus botulinus*, this being the first recorded outbreak of this type of food poisoning in Britain. Further light may be thrown on the outbreak by the laboratory investigations now in progress.

In the cases recorded in this outbreak the classical symptoms recurred with the most painful uniformity. The early ocular weakness, the gradual involvement of throat, larynx, and tongue, the ultimate failure of the respiratory centre—all without local pain and with complete retention of consciousness—these were seen in one case after another. The local medical attendant, Dr. W. W. N. Knox, was supported by other physicians, who had come to the neighbourhood on holiday, including Prof. T. K. Monro and Dr. W. E. Carnegie Dickson.

By arrangement with the Medical Research Council the materials for bacteriological and pathological investigation have been sent to the Bristol University laboratory, where they will be examined by the staff, under the supervision of Dr. W. G. Savage.

Insch Memorial Hospital.

The Insch and District (Aberdeenshire) War Memorial Cottage Hospital, erected in commemoration of the men from the parishes of Chapel Garioch, Culsalmond, Insch, Leslie, Oyne, and Premnay, who fell in the recent war, was opened on August 24th by Sir Napier Burnett, chief executive officer of the British Red Cross. The hospital contains several wards, and has accommodation for 12 patients, as well as for the nursing staff and servants. Sir Napier Burnett, before unveiling the memorial and opening the hospital, referred to the subject of rural hospitalisation in relation to the hospital problem as a whole. In large city hospitals, he said, there was great congestion, the approximate average daily occupation of beds being 90 per cent., whereas in cottage hospitals in country districts the average occupation was just over 60 per cent. "Surely," he said, "pressure on infirmary beds can be relieved by making better use of available beds in the country hospitals. In other words, the services of the infirmary staff might be made available for patients resident in country districts, and instead of anxious patients having their names put on a waiting list, some at least might be dealt with in hospitals near home. The medical profession in city and county had, he pointed out, an excellent opportunity of evolving a model scheme of coördinated hospital service for a county where hospital provision was none too abundant; the country had recently placed before it, by the National Labour Party, a scheme for the provision of adequate hospital facilities in replacement of the present voluntary system. Without entering into any criticism of the proposed nationalisation scheme, he suggested that the existing voluntary system, which was so suitable to the spirit of the British people, could be considerably strengthened if the medical profession would come forward and act in an advisory capacity to hospital governors, suggesting how the hospital needs of a community were to be met. The profession, he said, ought to be the guide of the community in all matters pertaining to health, and in none more than in the question of hospitalisation.

A Scottish Medical Officer's Canadian Appointment.

Dr. J. R. Currie, a senior medical officer of the Scottish Board of Health, has been appointed to the Chair of Preventive Medicine in Queen's University, Kingston, Ontario. Professor Currie was educated at the Universities of Edinburgh and Oxford, and studied medicine at the University of Glasgow. He has had wide experience of preventive medicine as a medical officer of health in Great Britain, and was at one time an assistant investigator under the Royal Commission on the Poor-law. In 1912 he entered the service of the Scottish Insurance Commission; during the recent war served in France and Italy, and acted for some months as Chief D.C.M.S. (Scotland) in the Ministry of National Service, while Dr. Norman Walker was C.M.S. After returning to duty with the Insurance Commission he passed into the service of the Scottish Board of Health. Dr. Currie has written numerous papers on medical and public health subjects; his report on Rosyth workers' housing was printed as a White Paper in 1914. His report on the necessitous districts of the Lowlands of Scotland forms an appendix to the recently published Third Report of the Scottish Board of Health. The history by him of medical recruiting in Scotland during the war is due to appear shortly.

The late Dr. W. B. Alexander of Edinburgh.

Dr. William Black Alexander, who died at Edinburgh on August 18th in his seventy-ninth year, carried on an extensive practice in the city for 40 years. Receiving his education at Edinburgh University, he became L.R.F.P.S. Glasgow in 1869, and was at one time medical officer at the City Fever Hospital. For many years he was one of the district medical officers of the Edinburgh Parish Council, and in 1911

he was appointed surgeon-apothecary to H.M. Household, Holyrood Palace. Dr. Alexander was a widower, and leaves four sons, of whom the eldest, Dr. Hugh Alexander, is medical superintendent of the Aberdeen City District Asylum; another son, Mr. W. B. Alexander, is practising in London as a dental surgeon.

CZECHO-SLOVAKIA.

(FROM OUR OWN CORRESPONDENT.)

Sanitary Organisation of the Republic.

AFTER 1871 the territory of the Czecho-Slovak Republic, which at that time formed a part of the Austrian Empire, was divided into sanitary districts comprising a population of 5–10,000 inhabitants. Each district had its local health officer, who was paid from local funds; the supervision of some 15–20 districts was in the hands of a county health officer, a State employee. Each town with a population over 6000 had the right to appoint one or more town or city health officers, who were paid by the municipality. Of the three, only the municipal health officer had to undergo a special examination, after two years' practice in a general hospital, in order to obtain a certificate of public health which enabled him to fill the position. There were no regular courses, with a prescribed curriculum, for this purpose, although two to three months' private courses were given by professors at the University of Prague. Examinations for the certificate were held twice a year. The county health officers were looked upon as an agent of the hated State administration, and there was practically no cooperation between them and the local health officers. When the Republic came into being the gap between these two links of the health service was widened. The salaries of local health officers were not raised in spite of the depreciation of the currency, whereas the salaries of the State employees were increased; the result was that local health officers refused to perform even the few duties which they had previously carried out, and it became necessary to unify the public health service, to remove the differences which existed between the two grades of health officer, and to give a better salary to the local men who should form the backbone of the service. The Minister of Public Health and Physical Education suggested nationalisation of the health service, and his scheme was accepted by the Czecho-Slovak Parliament in 1920, but it was made dependent on the reorganisation of State administration on a provincial basis; this did not help the situation, as a more rapid remedy was required. The whole medical profession had to be mobilised before this law could be put into action; this was done by Parliament in one of its last summer sessions.

The law makes it a duty of the health officer to take measures to combat the spreading of contagious diseases, to serve as tuberculosis officer of his district, and to take care of the sick poor. All health officers who have not been in the health service for five years before the enactment of the law have to qualify for the certificate of public health. Boards of health will be created in all districts which have a local health officer, and will serve in an advisory capacity in matters pertaining to the execution of this law. Members of a board will not receive any monetary reward. Until the whole State has been reorganised into counties the health officers will not become regular State employees; they will serve under a contract with the State, which will pay for their services and give the right to a pension for health officers and their families.

Before the enactment of this law it was difficult to fill vacant posts in parts of the country, especially in Slovakia, where the population is backward and where the physician could not earn a living. The Ministry of Health now has authority to give special bonuses to physicians in remote country districts, and anyone who has served for two years in such a district will be given preference before other applicants when applying for a post elsewhere. Local health officers are allowed to practise medicine so long as it does not interfere with their duties, and are even allowed to accept positions with a fixed salary as a railway physician, medical officer in an insurance association, &c., but are not allowed to serve on the staff of a hospital.

The new law, although it lays fresh foundations for the public health service of the Republic, establishes nationalisation only of the personnel of the service. It remains the duty of each community to bear the expense of measures such as disinfection, transportation of the sick, &c. It is hoped that in this way health officers will be made independent of local conditions, and that they will perform their duties more strictly without fear of losing their positions. One of the provisions makes it obligatory upon every district to equip a maternity ward for women, and a ward for the isolation of infectious diseases, with suitable transport. Each district must also undertake the provision of a sufficient number of midwives, and to refund these women for attendance upon the indigent poor. It is to the credit of the late Minister of Public Health, Dr. Ladislav Procházka, and of his successor, Dr. Bohuslav Vrbensky, that this important law was enacted at a time when the strictest economy is practised in all branches of the administration.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are announced: Surg.-Cmdrs. B. Pick to *Impregnable*; R. H. St. B. E. Hughes to *Argus*; L. C. Hunt to *Tamar* and for Hong-Kong Yard; J. D. Keir to *Carlisle*; and F. H. Holl, R. N. W. W. Biddulph, W. P. Hingston, G. L. Buckeridge, and J. C. G. Reid to *President*, addl., for three months' hospital course.

Surg.-Cmdr. A. J. Wernet is placed on retd. list at his own request with the rank of Surg. Capt.

ROYAL NAVAL RESERVE.

The following are granted commissions as Surg. Lieut. for short service: R. W. Mussen, P. J. Grimes, A. A. Pomfret.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. A. F. Carlyon is placed on the half-pay list on account of ill-health.

Maj. T. W. Stallybrass is restd. to the estabt.

Maj. B. A. Odlum retires, receiving a gratuity.

Capt. R. W. Galloway to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Hygiene.

Capt. H. A. Crouch, from the half-pay list, is restd. to the estabt.

The undermentioned temp. Capts. relinquish their commns. and retain the rank of Capt.: W. Stanwell, B. McDermott, C. A. Meaden.

Temp. Capt. R. W. S. Christmas relinquishes his commn. and is granted the rank of Maj.

MILITIA.

Capt. R. A. Greenwood relinquishes his commn. and is granted the rank of Maj.

TERRITORIAL ARMY.

Capt. W. A. Robertson to be Maj.

Capts. J. G. Willmore (late R.A.M.C.) and J. K. Davies (late R.A.M.C.) to be Capts.

E. A. Sparks (late Surg. Sub-Lt., R.N.V.R.) to be Lt.

Lt.-Col. L. W. Pockett, having attained the age limit, is retired and retains the rank of Lt.-Col., with permission to wear the prescribed uniform.

Maj. W. F. Roe relinquishes his commn. on account of ill-health and is granted the rank of Lt.-Col.

Maj. W. C. Murray, having attained the age limit, is retired and retains the rank of Maj., with permission to wear the prescribed uniform.

Maj. J. H. Hobling, having attained the age limit, is retired and retains the rank of Maj.

Capt. H. N. Barnett, having attained the age limit, is retired and is granted the rank of Lt.-Col.

Capts. J. M. Dupont and W. H. Morrison, having attained the age limit, are retired and are granted the rank of Maj.

The undermentioned offrs. resign their commns. and retain their rank except where otherwise stated: Capts.

R. G. Walker, J. A. Henderson, and D. W. Berry (granted the rank of Majs.), N. Scott, R. Lawson, and A. J. G. Hunter.

General Hospitals: Capt. W. J. Foster, having attained the age limit, is retired and retains the rank of Capt.

ROYAL AIR FORCE.

J. F. Carruthers is granted a temporary commission as a Squadron Leader.

INDIA AND THE INDIAN MEDICAL SERVICES.

Capt. T. A. Hughes (Bt. Maj.) to be Maj.

Lts. E. C. A. Smith and N. H. Smith to be Capts.

E. C. A. Smith (temp. Capt., R.A.M.C.) and N. H. Smith (late temp. Capt., R.A.M.C.) to be Lts.

The Viceroy has appointed Lt.-Col. R. P. Wilson to be Honorary Surgeon on his personal staff, vice Lt.-Col. Lister, retired, and the following have been nominated members of the United Provinces Medical Council: Maj. M. A. Rahman, Principal Medical School, Agra, vice Lt.-Col. A. W. R. Cochrane, resigned; Lt.-Col. H. R. Nutt, King George's Medical College, Lucknow, vice Lt.-Col. C. A. Sprawson, resigned; and Maj. A. W. R. Mearns, Assistant Director of Public Health, United Provinces, vice Lt.-Col. C. L. Dunn, resigned.

Maj. A. W. Mearns, officiating director of public health, United Provinces, has been appointed to be a Member of the United Provinces State Board of Medical Examinations, vice Lt.-Col. C. L. Dunn, who is granted leave. Maj. H. W. Acton has been appointed to carry on the duties of the Director and Professor of School of Tropical Medicine and Hygiene, Calcutta, in addition to his own duties during the leave of Lt.-Col. J. W. D. Megaw.

The undermentioned officers held appointments on the Staff of the Wana Column, as stated:—Assistant Director, Medical Services: Lt.-Col. C. Hudson. Deputy Assistant Directors, Medical Services: Capts. (temp. Majs.) W. M. Cameron and J. M. Mackenzie.

NEW UNIFORMS FOR INDIAN MEDICAL SERVICE.

The question of new uniforms for Indian Medical Service officers has for some time past been engaging the attention of the Government of India and has been examined by a departmental committee, whose recommendations are at present before Government. This committee was presided over by Surg.-Gen. Sir W. R. Edwards, Director-General, Indian Medical Service, and the following officers of the Indian Medical Service were members: Col. James Jackson, Lt.-Col. Carey Evans, Maj. E. S. Phipson, Maj. Williams, Maj. M. A. Nicholson, Capt. H. K. Rowntree and Capt. A. N. Bose.

NEW ARMY PAY WARRANT.

The War Office has just issued a new edition of the Pay Warrant, the first to be published since December, 1914. Subsequent changes in the rates and conditions of Army pay and allowances of both officers and other ranks, and the new basis for assessment of disability pensions, have necessitated the issue of a large number of Royal Warrants. These are now incorporated in the new edition. Few sections have escaped amendment. The new Warrant is published by His Majesty's Stationery Office and may be obtained through any bookseller at 2*s*.

NAVAL MEDICAL MEMORIAL.

On August 15th at the Royal Naval Hospital, Haslar, Sir Robert Hill, Medical Director-General, R.N., unveiled a memorial tablet erected on the main wall of the hospital entrance to more than 200 medical officers and members of naval nursing staffs, who were killed or died on active service during the war. He said he could conceive of no more suitable spot in which to place the tablet than in the gateway of that old naval hospital. Through that gateway, built in the eighteenth century, passed every probationer and surgeon, and future generations would pay their tribute to the sacrifice of their late brother officers and nursing sisters, who gave their all for King and country, and left for ever an example of patriotism. Those present included Surg. Rear-Admiral W. Bett, in charge of the hospital, Surg. Rear-Admiral Sir George and Lady Welch, Surg. Rear-Admiral W. J. Colborne, and Surg. Capt. A. R. Bankhart.

AUXILIARY R.A.M.C. FUNDS.—At the usual quarterly committee meeting, held recently, grants were made to cases in the benevolent branch for the orphans of officers, amounting to £600, and grants in the relief branch for the widows and children of rank and file, amounting to £317. Requests for relief should be addressed to the hon. secretary at the offices of the Funds at 11, Chandos-street, London, W. 1.

Correspondence.

"Audi alteram partem."

THE WOOD-HILL FUND.

To the Editor of THE LANCET.

SIR,—This Fund being now closed with the publication of the tenth and last list of subscriptions, it would seem desirable to make some comments on the significance of the verdict given in this case, and to give some details about the Fund itself.

An action was brought against Dr. H. Wood-Hill, of Beccles, for alleged negligence in the treatment of a lady who was suffering from a fractured femur the result of an accident. The case was reported in your issue of Nov. 19th, 1921. Notwithstanding that evidence was brought forward to show that Dr. Wood-Hill treated the case by approved modern methods, and that when the lady left his neighbourhood to go to her own home he urged her to consult her own doctor and to be guided by his advice before she put any weight on the limb, the jury returned a verdict for the plaintiff with damages to the amount of £750.

The verdict at once excited widespread sympathy with Dr. Wood-Hill, as it was felt that a serious miscarriage of justice had taken place. Unfortunately Dr. Wood-Hill had neglected to join one of the Medical Defence Societies, and for this lack of foresight no excuse can be offered. The costs of the action with the damages awarded came to the large sum of £2250. The fund to assist him in this serious emergency was started by a letter of appeal signed by us in your issue of Dec. 3rd, 1921.

The verdict is of great importance to the medical profession. It proves that although a medical man may have exercised all the skill at his disposal, and adopted approved modern methods in the treatment of a case, yet he still has to run the risk of an adverse verdict if the case does not finally do well. We feel this to be an unjust widening of a medical man's responsibility in the practice of his profession. Prior to the case of Clayden *v.* Wood-Hill, a medical practitioner might feel fairly confident that if, in the treatment of a case, he used the ordinary care and skill which could rightly be expected of him, he ran small risk of an adverse verdict in an action for alleged negligence. This is no longer so. The moral to be drawn is that in no circumstances should a medical man engage in practice without being a member of one of the Medical Defence Societies. Further, no medical man, after the warning which the profession has received by the case of Clayden *v.* Wood-Hill, need expect in any future similar case to be treated by his fellow practitioners with the generosity accorded to Dr. Wood-Hill.

A few details about the Fund may be of interest to your readers:—

	£	*s.*	*d.*
Total amount subscribed	1717	4	4
Bank interest	19	13	10
	1736	18	2
Expenses	6	5	0
Net total	1730	13	2

A cheque for this amount has been forwarded to Dr. Wood-Hill.

The Fund was made up of the following amounts:—

	£	*s.*	*d.*
33 Divisions of the British Medical Association subscribed	320	14	6
4 Branches of the British Medical Association subscribed	66	14	10
14 Medical Societies subscribed	150	17	0
14 Honorary Medical Staffs of Hospitals subscribed	132	7	0
4 Local Medical and Panel Committees subscribed	56	19	6

Subscriptions from individuals were responsible for the remainder of the Fund. The highest individual subscription was 25 guineas; the lowest 2*s*.

The widespread interest taken in this case is shown by the fact that subscriptions were received from such

far distant places as New Zealand, Tasmania, Queensland, Toronto, Oporto, Nigeria, Khartoum, South Africa, and Baghdad.

We are, Sir, yours faithfully,

ROBERT JONES (Liverpool),
GEORGE E. GASK (London),
R. C. ELMSLIE (London),
JOHN LYNN-THOMAS (Cardiff),
HAMILTON A. BALLANCE (Norwich),
WILSON TYSON (Lowestoft).

August 18th, 1922.

Tenth and Last List of Subscriptions.

Amount previously acknowledged .. .. £1573 4*s.* 4*d.*

	£	*s.*	*d.*
Members of the Ipswich Local Medical and Panel Committee (per Dr. W. L. Hibbert, Hon. Sec.): Drs. Fryer, Hibbert, Pretty (second donation), J. de Staddon, Cecilia Williamson, Cameron Young, each £2 2*s.*; Drs. Adams, Baylor (second donation), Bellward, R. O. Eades, A. R. Hill, McKinnon, each £1 1*s.*; Drs. Crosswhaite, S. O. Eades (second donation), Walsh, each 10*s.* 6*d.*	20	9	6
Fifteen members and four non-members of the South Middlesex Division of the British Medical Association (per Dr. T. Ruddock-West, Hon. Sec.) ..	15	0	0
"Some sympathisers" (per J. H. P.)..	11	11	0
Members of the Horsham Division of the British Medical Association (per Dr. J. W. Dew, M.C., Hon. Sec.): Drs. Matthews, Burn, Beachcroft, Kerr, Puttock, Druitt, each £1 1*s.*; Drs. Vernon, Kinneir, Juckes, Dew, Sparrow, Bradford, Fawkes, each 10*s.* 6*d.*; Dr. Boxall, 10*s.*; Dr. Child, 2*s.*.. ..	10	11	6
Members of the Kingston-on-Thames Division of the British Medical Association (per Dr. A. R. C. Doorly, Hon. Sec.): Drs. H. Cooper, E. G. L. Goffe, W. W. Maxwell, A. E. Evans, A. Senior, R. L. Crabb, H. E. Gray, Oswald C. S. Tandy, each £1 1*s.*; Drs. H. R. Cran, T. Letchworth, A. R. C. Doorly, each 10*s.* 6*d.*; Dr. C. S. Hamilton, 10*s.*	10	9	6
Members of the Queenstown Branch of the South African Medical Association (per Dr. J. A. van Heerden, Hon. Sec.): Drs. Hay Michel, Grieve, Ritchie, Alabaster, de Villiers, McGregor, Arnott, Kerr Bell, Bouwer, Thomas, Gooding, Paisley, Munro, Cowen, Krige, van Heerden	8	8	0
Members of the West Dorset Division of the British Medical Association (per Dr. P. W. Macdonald, Chairman)	7	17	6
Members of the Winchester Division of the British Medical Association (per Dr. Gerald A. Smythe, Hon. Sec.)	6	10	0
The Bury Division of the British Medical Association (per Dr. W. Webster Wilson, Hon. Sec.)	6	6	0
Members of the Eastbourne Division of the British Medical Association (per Dr. William Muir-Smith, Hon. Sec.): Dr. T. Burfield, Heathfield, and Dr. W. Muir-Smith, Eastbourne, each £2 2*s.*; Dr. A. C. Gurney and Dr. Leslie Muir-Smith, Eastbourne, each £1 1*s.*	6	6	0
Members of the Southland Division, New Zealand Branch of the British Medical Association (per Dr. Stanley E. V. Brown, Hon. Sec.)	6	0	0
Drs. de Nyssen and Aylen, Halesworth	5	5	0
Members of the Brighton Division of the British Medical Association (per Dr. L. A. Parry, Hon. Sec.): Drs. Charles Simpson, A. H. Dodd, and Donald Hall, Hove, and Dr. Walter Broadbent, Brighton, each £1 1*s.*; Dr. Florence Edmonds, 10*s.* 6*d.*..	4	14	6
Further contribution from members of the Chichester and Worthing Division of the British Medical Association (see list published April 29th) (per Dr. H. J. M. Milbank-Smith, Hon. Sec.)	3	13	6
Members of the Wiltshire Branch of the British Medical Association (per Dr. F. F. Bond, Hon. Sec.): Drs. Bond and Jones, each 10*s.* 6*d.*; Drs. Ward and Semple, each 10*s.*; Drs. Haydon, Vivian, Adeney, and Johnstone, each 5*s.*	3	1	0
Further contribution from members of the Rochdale Division of the British Medical Association (see list published April 29th) (per Dr. James Melvin, Hon. Sec.): Dr. J. Dunlop, Rochdale, and Dr. F. W. Hartley, Heywood, each £1 1*s.*	2	2	0
Dr. F. Fowler Ward, Ipswich	2	2	0
Members of the Nottingham Division of the British Medical Association (per Mr. A. M. Webber, Hon. Sec.): Dr. C. J. Palmer, Mansfield Woodhouse, and Dr. T. J. T. Wilmot, Sutton-in-Ashfield, each £1 1*s.*	2	2	0
Dr. James A. Ainscow, Birmingham; Mr. Clement W. Branson, Bournemouth; Dr. J. R. Keith, Driffield; Dr. E. L. Martin, Hull; Dr. A. G. Osborn, Windsor; Dr. J. W. Thomson, Nigeria, each £1 1*s.* ..	6	6	0
Members of the Lewes and East Grinstead Division of the British Medical Association, Hon. Sec., Dr. H. Vallance (per Mr. L. Ferris-Scott)	1	1	0
Dr. St. George B. Delisle Gray, Oporto; Dr. James W. Smith, Ryton-on-Tyne, each £1 1*s.*	2	2	0
Further contribution from the Hartlepools Division of the British Medical Association (see list published June 3rd), Hon. Sec., Dr. J. E. Mitchell (per Dr. Alfred Cox, O.B.E.)	1	1	0
"S. W."	0	10	6
Dr. D. Kennedy, Newbury	0	10	6

NUCLEINIC ACID FOR TABES AND G.P.I.

To the Editor of THE LANCET.

SIR,—In THE LANCET of May 13th (p. 963) appears under the above title a short article based upon a lecture given by me at the German Medical Society of Prague, the substance of which was by accident communicated sooner to the daily press than to the medical journals. This short article is misleading, although the statement is correct that Horbaczevski was the first in the year 1892 to show the ability of nuclein to increase the leucocytes in the circulating blood. Following on this discovery leucocytosis became a therapeutic method by administration of nuclein at first by the mouth and later by injections.

In progressive paralysis (G.P.I.) I was myself the first (simultaneously with, and independently of, Donath in Budapest) to employ sodium nucleinate, on the basis that leucocytosis should be the aim. It has long been known that remissions occasionally do occur in G.P.I. after febrile intercurrent affections. Study of these remissions showed that they were the sequel of septic infections, never of typhoid. Now, in sepsis leucocytosis is constantly present; in typhoid, on the other hand, leucopenia is the rule. Donath's train of thought which led him to nuclein was of another kind. The first experiments published in 1919 gave encouraging results which, with improved technique and proper selection of material, ultimately justified the conclusion that G.P.I. can no longer be regarded as an absolutely incurable malady. With intentionally produced fever the attempt was already made in the middle of last century to influence G.P.I., employing for this purpose artificial suppuration. After the discovery of tuberculin, Wagner-Jauregg in Vienna used this product extensively for the treatment of G.P.I. with remarkable results; latterly he introduced artificial malaria infection as a curative agent.

Attempts still further to improve the results of nuclein therapy led to phlogetan, which consists of nucleo-proteins so far broken down that it neither has the character of albumin nor contains nucleinic acid. (How the author of the critical note can say that the preparation contains nucleinic acid is completely unintelligible to me.) This preparation which has in principle the same physiological action as nuclein appears as far as G.P.I. is concerned to give essentially better results, although at present nothing definite can be said, inasmuch as for G.P.I. only many years' experience can count. On the other hand, striking improvement, not otherwise obtainable, followed its exhibition in tabes. For details I must refer readers to my article in the *Medizinische Klinik* for May 7th.

The author of the critical note declares himself to be a sceptic in regard to new means of treating diseases of a degenerative nature, the changeable clinical picture which they present making the effect of any treatment very hard to assess. He would be right if we were here only dealing with light-hearted publication of isolated cases, but from the time of Wagner-Jauregg and his school publications have been so extensive that such an objection gives an impression of insufficient knowledge. His train of thought is apparently as follows: In G.P.I. and tabes degenerative changes occur in the central nervous system; such changes are in general not remediable; consequently there can be no cure. This argument is heard repeatedly and only illustrates the falsity of the catch-word habit of thought in medicine. True enough, central nervous tissue, once destroyed, cannot be regenerated; but this applies only to actual destruction. Experiment has only established that nervous tissue which has been mechanically destroyed or otherwise rendered necrotic is not regenerated, and in particular that fibres in the central nervous system, once completely cut, do not again unite. But it is false to substitute for "destroyed" the word "degenerated" or even "degenerating," and in tabes and G.P.I. there is, as a rule, no complete division of fibres but the specific tissue is involved in a kind of atrophic

dissolution. We cannot justly assume that tissue which is being destroyed in this way cannot again be regenerated, for we do not know to what grade central nervous tissue must be degenerated or atrophied before it loses the power of regeneration, whether or not the noxa which leads to degeneration is still there. Experimental histopathology has many like questions still to solve. Furthermore, in the case of such exceedingly chronic diseases as G.P.I. and tabes the affected fibres are not all equally degenerated from the start. Characteristic syphilitic processes lie at the root of both diseases and lead to degeneration. Our chief task is to stop these processes; the question of regeneration is of another order.

On all these matters it is difficult to bring purely theoretical argument to bear. At present only systematic empiricism can give a clear answer—systematic work on abundant material with constant comparison of treated and untreated cases. Results of treatment with tuberculin, malaria and recurrens poisons, and also with nuclein have shown that cure can be reached in clinically certain cases of G.P.I., and that success is the more easily attained the earlier the treatment is begun and the younger the patient.

This unspecific treatment of metasyphilis offers, according to present experience, the best chance of success. With great probability a considerable rôle may be assigned to it in the prophylaxis of these diseases. The conditions must first be studied under which optimal results can be obtained. Especially we need to clear up whether this unspecific process which I have called phlogetic therapy alone suffices, or whether it should be combined in any form with the usual antisyphilitic remedies.

It is false to accept everything new in an uncritical spirit, but it is falser to seek to discard anything that does not fit into the existing system instead of carefully and critically proving. For thereby many workers are turned aside from new problems.

I am, Sir, yours faithfully,

Prague, August 15th, 1922. OSKAR FISCHER.

*** The brief note was written by our Special Correspondent in Prague, a local medical man, who expressed no personal scepticism.—ED. L.

BED-ISOLATION.

To the Editor of THE LANCET.

SIR,—A bed-isolation ward of 32 beds and cots (8 beds and 8 cots in each division of the ward) for women and children under 8 years of age, was opened at the Birmingham City Hospital, Little Bromwich, in June, 1920. On reference to the register I find that, up to the time of writing, 800 cases of types similar to those tabulated by Dr. C. Rundle and by Dr. D. MacIntyre in your issue of August 19th, have been admitted to the ward. Chicken-pox in the early eruptive period *has* been safely nursed in this ward, but on two occasions cases of this disease admitted in the incubation period "crossed" and subsequent cases appeared in the ward. One case of measles also admitted in the incubation period initiated cross-infection, and finally a second case of scarlet fever arose from an example of septic type admitted to the ward.

In each instance cross-infection was, I believe, not due to aerial spread or to contact of one patient with another, but to a flaw in technique. On one occasion, for example, spread of varicella from one division of the ward to the other—neighbouring susceptible cases escaping—was probably due to a night nurse who went on duty with an unreported bandaged finger which it was impossible efficiently to sterilise between cases. At present my policy is not to admit varicella in the incubation or early eruptive period to this ward. Varicella in later stages—when I believe the infectivity to be greatly lessened—I have no hesitation in admitting. As many as three cases of measles in the early pre-eruptive (Koplik's spots) stage have been safely treated at one time in a single division of the ward.

A study of weekly charts of the ward population giving the histories of previous attacks of the common infectious diseases shows that protection by reason of previous attack plays a useful part in the successful working of the system of bed-isolation, but I am in agreement with Dr. MacIntyre that there is no advantage in attempting to move patients to "safe" positions. The degree of protection afforded by previous attack varies, of course, with the age distribution of the ward population at the time and for each disease. There is a high percentage of protection against measles in the case of children over 5, and therefore when the ward population at any given moment contains a large proportion of infants under 5, measles, if admitted in the intensely infective pre-eruptive stage, is much more likely to be spread at that time than if the age distribution of the ward lies chiefly in the higher age periods. It is probable that with a sufficiency of material the chances of protection by previous attack could be mathematically stated for each disease at different age periods.

The four instances of breakdown which I have to record in course of treatment of these 800 cases are by no means discouraging. During practically the whole time the ward has been open the hospital has been working at high pressure. The ward, moreover, has been carried on with a wall space of only 9 feet per bed, as against 12 feet in the Plaistow ward. This latter fact, of course, strengthens the case for bed-isolation and greatly weakens the aerial-spread theory, but the larger number of cases in the ward enormously increases the strain on the staff. I have recently been able to reduce the number of patients in the ward by eight—four in each division.

I had the privilege of working in 1910–11 in Dr. Rundle's original bed-isolation ward at Fazakerley. My experience then, and more recently in this hospital, has convinced me of the enormous utility and economy of bed-isolation. I would go so far as to say that I find the bed-isolation ward indispensable. The ideal of an infectious diseases hospital should be, I am sure, to have every patient "barrier-nursed." There is also, in this hospital, a ward worked on a modification of Dr. Biernacki's system of coloured bands or cords. The primary infection admitted to the ward is scarlet fever. Patients suffering from the simple type of this disease are indicated by a blue band at the foot of the bed, whilst those admitted with septic types, or having such complications as diphtheria or parasitic skin infections, are denoted by red bands at the foot of the bed. With the exception that the primary infection admitted is in every case scarlet fever, and that the types of cases are distinguished by coloured bands, the ward is run exactly as a bed-isolation ward. No spread of diphtheria or parasitic skin infection has ever occurred in this ward. I contemplate running the ward on pure bed-isolation lines—that is, without the symbols of coloured material, which I am sure are unnecessary.

In conclusion, I would emphasise what Dr. Rundle has always insisted upon—that is, the absolute necessity of the sister in charge being a well-trained "surgical" nurse.—I am, Sir, yours faithfully,

E. H. R. HARRIES, M.D. Lond., D.P.H.,
Medical Superintendent.

Birmingham City Hospital, Little Bromwich,
August 25th, 1922.

To the Editor of THE LANCET.

SIR,—In your interesting leading article on the Use of Isolation Hospitals in THE LANCET of August 19th, you refer to the method "of so-called bed-isolation, introduced in the first instance at Fazakerley Hospital . . . ." All the world knows and appreciates the good work done at Fazakerley; but, as a matter of fact, the expression "bed-isolation" was invented by me to denote the method I devised and practised at Mortlake so far back as 1907. Some account of this method will be found in the Proceedings of the Royal Society of Medicine (Epidemiological Section, 1910, iii., 83–85) and in THE LANCET (1910, i., 512–514).

The Fazakerley method, which differs only, I believe, in detail, and not in principle, was not described before 1912, so far as I am aware. My opportunities at Mortlake were small, and it is a matter for thanksgiving that at Fazakerley experiment and observation on a larger scale have been possible.

I am, Sir, yours faithfully,

F. G. CROOKSHANK.

Wimpole-street, W., August 19th, 1922.

DIGITALIS IN AORTIC REGURGITATION.

To the Editor of THE LANCET.

SIR,—Some few years ago a controversy arose, and was renewed from time to time, as to the advisability of prescribing digitalis in cases of pure aortic regurgitant disease of the heart. I expressed my disapproval of the drug in this particular form of cardiac affection, and quoted, in support of my contention, the cases of some patients who attained longevity under this line of treatment—i.e., without digitalis. A lady, whom I have contantly seen during the past 25 years, has now died, aged 86. She had aortic insufficiency, and during this long period which she has been under my observation, she has not had a single dose of digitalis. She was a surviving twin, her sister having died three and a half years ago. Your readers will probably agree that this case is sufficiently remarkable to deserve recording.

I am, Sir, yours faithfully,

London, August 28th, 1922. SEYMOUR TAYLOR.

THE CONFLICTING ÆTIOLOGY OF RICKETS.

To the Editor of THE LANCET.

SIR,—As you suggest in an annotation in THE LANCET of August 19th (p. 400), the want of harmony among those who are studying the causation of rickets is not really as great as it appears. Thus, the views of Dr. Lawson Dick expressed in his book on Rickets[1] can readily be reconciled with the want of sunlight hypothesis; firstly, the geographical distribution of the disease and, secondly, the association with the slum environment of industrial towns. In the time of Glisson the children of the rich were "bottled up" from the sun and developed rickets, just like the well-to-do children of India to-day, as described by Dr. H. S. Hutchison. Is it not also reasonable to suppose that want of sun is the chief factor which operates in the slum environment of Glasgow? What amount of sun can the little children living in a flat, several floors from the ground and built in a sunless "back-land," get in the winter in a smoky town like Glasgow?

It is a pity that no representative of the Vienna workers was able to take part in the Glasgow discussion. The work done in Vienna confirms the work of Hess and his co-workers as to the preventive and curative effect of sunlight, of the light from the mercury-vapour lamp, and of cod-liver oil. Prof. Noël Paton quoted von Pirquet as being of opinion that rickets did not occur with a diet low in fat provided the energy value of the diet is kept up by an excess of carbohydrate. But the work at von Pirquet's Vienna hospital during the last 18 months is a direct contradiction of this. Reference to the preliminary report[2] of the Vienna workers shows that infants were divided into two groups fed on Diet I. and Diet II. respectively. Diet I. was of higher calorie value than Diet II. and contained an excess of carbohydrate. Diet II. consisted of a full-cream dried milk and cod-liver oil. No less than 14 out of 24 infants developed rickets during the winter on Diet I. with its higher calorie value and high carbohydrate content, while none of the 24 infants fed on Diet II. developed rickets during the same period.

The discordant opinions about the teeth in rickets may be more easily reconcilable now that it is established on the authority of Schmorl, amply confirmed by the work at Vienna, that rickets may begin within a few weeks of birth and is, in fact, very common during the first six months of life. Dr. Lawson Dick shows diagrammatically (p. 199) the ages at which calcification of the temporary and permanent teeth takes place. He also demonstrates that portions of the permanent teeth which are defective as the result of rickets are those the enamel of which is laid down during the first two years of life. The recognition of the fact that rickets quite commonly occurs within a few weeks of birth would seem to furnish an explanation as to how rickets may affect the temporary teeth and help to bridge the difference between the experimental work of Mrs. Mellanby and the opinion held by Dr. Sim Wallace. The temporary teeth are not completely calcified at birth, and it seems obvious that the onset of rickets within a few weeks of birth may affect them as well as the permanent teeth. Another point with regard to which we appear to be approaching unanimity is that the X ray examination of the bones is the only reliable means of diagnosing rickets in its earliest stages.

There are many points in this problem of great interest to the physiologist, the physician, and the pathologist which need further elucidation. The position of the sanitarian is, however, clear. He must devote more attention to the smoke problem, for it is not too much to say that by the utilisation of such sunlight as we get in our climate, supplemented by a reasonable diet and the judicious use of cod-liver oil we can reduce the prevalence of rickets to a vanishing point.

I am, Sir, yours faithfully,

August 24th, 1922. M.O.H.

[1] Reviewed in THE LANCET, July 1st, p. 20.
[2] THE LANCET, July 1st, 1922, p. 7.

CLINIC EXPERIENCE IN CONTRACEPTION.

To the Editor of THE LANCET.

SIR,—On p. 419 of THE LANCET, August 19th, Norman Haire, Esq., M.B., says of me: "Her ignorance of medical matters has led her to advocate, in her books, at her clinic, and elsewhere, the use of the gold-pin pessary, which has been condemned by British medical men and women." It is necessary to reply—

1. That the gold-pin has nothing whatever to do with the use of the rubber occlusive cap, which was the sole subject of my letter.

2. That the gold-pin is NOT used at my clinic, which was established to deal with normality.

3. That I advocate its use in one only of my books ("Wise Parenthood") for abnormal cases only, and that no impartial person could leave it out of such a text-book of methods.

4. That my advocacy is not due to ignorance, but to an impartial scientific attitude based on international knowledge. On this very point Mr. Haire had to admit in a public meeting that he was ignorant of the fact that the pin is used by leading American practitioners in U.S.A., the home of this technique.

When I was in New York some months ago for the fifth time I discussed the pin fully with American medicals of the highest standing who use it. British medicals condemning it are not condemning me, but their confrères. That the gold-pin is not to be disposed of internationally by individual condemnation is illustrated by a letter I received this week from a leading American, who writes me: "You are quite right in believing that I have myself used it in suitable cases quite extensively for a number of years. It has proved in every instance quite effective."

To return to the rubber cap, Mr. Haire says I "quite neglect to mention" what are the physiological objections I have to the Dutch cap he prefers to use. These, Sir, I desire to state in your columns; as you have published this jibe at me I rely on the fair attitude of THE LANCET to allot space at an early date for the statement of these objections.

I am, Sir, yours faithfully,

MARIE C. STOPES.

Marlborough-road, Holloway, N., August 21st, 1922.

Obituary.

JAMES ALFRED MANSELL MOULLIN,
M.B. OXF., M.R.C.P. LOND.,
CONSULTING PHYSICIAN TO THE SOHO HOSPITAL FOR WOMEN.

Dr. J. A. Mansell Moullin, whose death occurred in London on August 14th at the age of 72 years, was educated at Oxford and Dublin Universities, and after studying at St. Thomas's Hospital took his medical qualification in 1876. In the following year he became M.B. Oxf., and shortly after M.R.C.P. Lond. and the L.M.R.C.P. Ireland. He served as house physician at St. Thomas's and afterwards joined the staff of the West London Hospital as assistant physician for diseases of women, becoming physician in 1897 and consulting physician in 1910. His association with the Hospital for Women in Soho-square dates back over 40 years, when he was invited by the founder, Dr. Protheroe Smith, to join the staff at a time—happily long forgotten—when controversy between the medical officers and the lay board had damaged the hospital's professional reputation. Of his work in restoring the fair fame of the hospital one of his life-long friends and colleagues writes:—

"Our early difficulties were very considerable, and it was due in large measure to his quiet tact and persistence that they were overcome. We commenced to publish each year a detailed account of the statistics of the operations performed, and had the satisfaction of gradually showing their wider scope and lessened mortality from those days, in the early 80's, when curettages and perineal closures were the chief surgical measures, when ovarian tumours were removed with trepidation, when fibroids were treated by oöphorectomy, or by the external clamp, and when tubal diseases when recognised were treated by medicine and prolonged rest—down to the days when a series of severe laparotomies showed a mortality of less than 3 per cent. In all this steady advance, in the constant improvement both in diagnosis and surgical technique, Moullin took a part which has never received its proper recognition."

It was largely due to Moullin that the Soho Hospital started quite early a pathological department and museum, and that it threw open its out-patient department for systematic instruction to qualified medical men in the diseases of women, thus becoming a precursor of other post-graduate schools. Moullin himself was a bold and skilful operator. Thanks again to his diagnostic skill and clear exposition, the hospital attracted pupils in increasing numbers, not only from London and the provinces, but also from the United States and the British Colonies, and it afforded him keen pleasure to receive letters from practitioners all over the world acknowledging the assistance his teaching had afforded them in their daily work. Clinical rather than systematic teaching was his strength, and the printed contributions which Moullin made dealt largely with the treatment of cancer and other affections of the uterus, as in a series of articles which appeared in the *British Journal of Gynæcology*, or recorded interesting cases, as the pages of the *West London Medical Journal* over a period of years testify.

It is natural that the development of gynæcological knowledge and practice should largely fill the record of Moullin's professional life, for personally he was so reserved and diffident that strangers sometimes failed to realise his considerable abilities. To those who worked with him he was a charming companion, possessed of excellent judgment, a staunch friend, and a colleague whose constant readiness to assist could never be overtaxed.

JOHN ANDREW TURNER, C.I.E., M.D., C.M.EDIN., D.P.H. CAMB.,
LATE EXECUTIVE HEALTH OFFICER OF BOMBAY.

WE regret to announce the sudden death of Dr. John Andrew Turner, which occurred at Bexhill-on-Sea on Monday, August 21st, three weeks before his sixty-fourth birthday.

Born in New South Wales, Turner received his medical training in Edinburgh and London, where he took various courses at different schools. He graduated M.B., C.M. at Edinburgh in 1882, and afterwards visited Paris as a post-graduate student, making also a tour of the chief cities of Europe. He decided to take up the career of medical officer of health, and in 1888 he was appointed medical officer of health to the combined districts of Leicester and Rutland. While there he obtained the D.P.H. at Cambridge and showed his scientific acquaintance with sanitary problems as well as the practical use he could make of much bacteriological study. Nine years later—he was already marked out as a sound and well-equipped officer—he was appointed to the sanitary charge of Hertfordshire, and four years after that was chosen to be executive health officer at Bombay.

In Bombay the chief work of his life was done. He arrived at the beginning of 1901. In the previous completed year a total mortality had occurred in a city whose population was just over 800,000 of practically 80,000 persons. The mortality from plague alone was 13,000 and the infant mortality was the same, while small-pox, cholera, and measles had all contributed heavily to the toll, and tuberculosis was rife. The next 18 years of his life were spent in a fierce struggle for the sanitary reform of Bombay. He improved the standard of general health, food, and school inspection by training up his own officers; he arranged for quicker removal of refuse from the city and abolished the carting of night soil; he reorganised the system of birth- and death-registration, and was the mainspring of an association for the control of venereal diseases; he carried out an extensive malarial survey and organised two enumerations of the city's population—and along all these lines of endeavour and accomplishment he was ever insistent upon the education of the people that they might help themselves. As examples of the way in which he made sanitary progress a real thing in the eyes of the public it may be mentioned that he carried out in 1917 a survey of the secondary (high) schools in the city with a view to inquiring into the sanitary conveniences and arrangements for physical exercise and mid-day tiffin for the scholars, embodying the results in a book entitled "A Plea for Education in Hygiene and Public Health in India." Another important inquiry, conducted in 1917–18, was into the sanitary conveniences and servants' accommodation in the numerous hotels of Bombay. A report was submitted to the corporation, and as a result steps were taken not only to replace the sanitary anachronism of the commode system by water-closets, but to provide suitable and sufficient accommodation for servants on the hotel premises.

The central idea of Dr. Turner's work was the education of the people in the elementary principles of sanitation and hygiene so as to enable them to appreciate and assist in carrying out the practical measures taken to improve their condition. To this end he bent all his energies, encouraged by the success of his plague policy, the keynote of which was a sympathetic understanding of the people and a constant desire not to offend their susceptibilities. Whenever the health of the city was threatened with an epidemic, he tried to give the widest publicity to the measures proposed to be taken by publishing them as a press note and by the issue of leaflets in English and the local vernaculars posted in prominent places and widely circulated in chawls and localities inhabited by the poor; these were explained in the course of special domiciliary visits by the staff. What he could not readily achieve for the benefit of the people through official channels or methods, he sought to accomplish through the voluntary organisations which he started and worked with unfailing success, with the assistance of philanthropic citizens, the Government, the municipality, and the Western India Turf Club. In the words of one of the greatest municipal councillors of the city, Sir P. M. Mehta, Turner was a missionary of sanitation in the East. The earliest of these organisations was the Bombay Sanitary Association, started in 1904 with the object of (1) creating an educated public opinion with regard to sanitary matters in general, (2) diffusing a

knowledge of sanitation and hygiene and of the prevention of the spread of disease, (3) promoting sanitary science by arranging lectures and practical demonstrations in English and the vernaculars, and (4) providing facilities for training students as sanitary inspectors. The work of the Association has been signalised in more recent years by the establishment of the Bombay Sanitary Institute in 1915. Two years before Turner had prepared a scheme for enlisting the coöperation of the public with the health department in its efforts to reduce infant mortality and the danger to mothers from the ignorance and superstition of the untrained *dai* and the women who employ her. Thus was launched the "Lady Willingdon Scheme" in 1914. The work done under its auspices, which included (1) the instruction and training of dais, (2) health visitors, (3) comfortable maternity homes (two of these three have been taken over by the municipality), (4) infant milk depôts, &c., is well known.

In 1916 the effects of war made themselves increasingly felt on the health conditions of the city. Bombay became fearfully overcrowded; it was studded with war hospitals for the care of the sick and wounded who arrived in hundreds from the theatres of war; it was the port of embarkation and arrival for troops and followers, horses, foot and artillery, who, during their sojourn in the city, were encamped in different parts for weeks and under very difficult conditions; so that overcrowding and the evils that follow in its train were intensified. Sanitary improvements were held up owing to financial stringency. Then followed famine and pestilence, and during the latter half of 1918 Bombay was visited, in common with the rest of the world, with the pandemic of influenza. The outbreak of June and July was followed by a more appalling one in September and October; in December followed an epidemic of cholera which lasted to the end of February, 1919. With this situation Turner manfully struggled until slowly the tide turned. In April, 1919, though the corporation invited him to take an extension of office, he resigned, when the corporation recorded their appreciation of his varied and devoted services to the city in suitable terms and a public dinner was given in his honour. He had previously received the Kaiser-i-Hind Gold Medal (1st Class), and in 1916 was appointed C.I.E.

Dr. Turner wrote monographs at different times on tuberculosis, plague, and malaria as he had seen them in Bombay, and a general work on sanitation in India, which has been recognised as a standard work on the subject within the limitation that only urban conditions were dealt with in anything like detail. He was not one to whom writing much appealed; he was essentially a man of action as his career shows.

WILLIAM PENNEFATHER WARREN, L.R.C.P. EDIN., D.P.H.

Dr. W. P. Warren died suddenly at his residence at Enfield on August 17th in his sixty-third year. Receiving his medical education at Queen's College, Cork, at Edinburgh University, and at St. Bartholomew's Hospital, London, he qualified in 1882 and in 1888 began to practise at Enfield. During the course of his 34 years' work there he became senior partner in a firm of four practitioners who had in their hands the mass of practice in a thickly populated district between Waltham and Tottenham. In 1908 he was appointed medical officer of health for Enfield, and obtained the diploma of public health of the Royal College of Physicians and Surgeons of Ireland in the following year. His special care and aptitude in the matter of epidemic disease resulted in a considerable decrease in infant and general mortality-rates in his district. For some years, indeed, Enfield enjoyed the distinction of possessing the lowest death-rates of any in England and Wales. Dr. Warren's advice was widely sought in consultation; he was medical officer of the Metropolitan Water Board, divisional police surgeon, and surgeon to several Oddfellows' and Foresters' Lodges, being himself a prominent member of the Masonic order. His presence was always very welcome at professional and social functions, and his great personal popularity with his colleagues was of much use to him in his work. Dr. Warren leaves two sons, who for some years have been associated with him in practice.

WILLIAM FREDERICK LITCHFIELD, M.B., C.M. SYD.

Dr. W. F. Litchfield, who died suddenly on June 27th at his residence, Glebe Point, New South Wales, at the age of 51, was a well-known Australian medical man who devoted himself to the study of children's diseases. Born in 1871 at Pingah, in the Northern Territory, he was educated at Newington College and graduated M.B., Ch.M. with honours from the Sydney University in 1893. After acting as physician at Prince Alfred Hospital for two years, he became resident physician to Alexandra Hospital for Children, where he was afterwards honorary surgeon and a member of the board of directors, positions which he filled at the time of his death. Dr. Litchfield presided over the section of diseases of children at the Australian Medical Congress, held in Brisbane in 1920. He was a member of the council of the Royal Welfare Society for Women, a member of the council of the District Nursing Association, honorary physician for the Church of England Homes at Glebe, and in addition, found time for much humanitarian and social work. He leaves a widow and two daughters.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—E. E. Briant, Liverpool; D. J. Dubash, Bombay; F. D. Howitt, Guy's Hospital; J. I. Kelly, Manchester; J. Moore, Paris; S. D. Rieley, St. Mary's Hospital; A. Senn (Section I.), London Hospital; and H. Turover, Charing Cross Hospital.

Medicine.—E. E. Briant, Liverpool; H. S. Chadwick and H. Hirst, Manchester; F. D. Howitt, Guy's Hospital; J. Moore, Paris; C. F. Parry (Section I.), Guy's Hospital; and B. Zeitoun, King's College Hospital.

Forensic Medicine.—E. E. Briant, Liverpool; G. G. Brown, Aberdeen and Charing Cross Hospital; H. S. Chadwick, Manchester; E. Ezra, St. Mary's Hospital; A. Gugenheimer, Vienna; H. Hirst, Manchester; F. D. Howitt, Guy's Hospital; S. S. Kapadia, University College Hospital; J. Moore, Paris; and J. Totton, Guy's Hospital.

Midwifery.—E. E. Briant, Liverpool; G. G. Brown, Aberdeen and Charing Cross Hospital; L. A. Daly, St. Bartholomew's Hospital; M. K. El Khadem, Liverpool; A. Gugenheimer, Vienna; F. D. Howitt, Guy's Hospital; W. J. Verheyden, University College Hospital; and B. Zeitoun, King's College Hospital.

The diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: E. E. Briant, A. Gugenheimer, F. D. Howitt, and W. J. Verheyden.

ROYAL COLLEGE OF PHYSICIANS AND ROYAL COLLEGE OF SURGEONS, IRELAND: CONJOINT EXAMINATIONS.—At examinations held recently the following candidates were successful:—

FINAL PROFESSIONAL EXAMINATION.

Henrietta C. Ball, John T. Barrett, Herbert T. Beggs, Solomon S. Brass, Mary F. J. Connolly, Edward M. Dodd, Patrick Fleming, John A. Flynn, Patrick J. Greene, Vincent E. Lee, Maurice Levy, John J. A. Loftus, Daniel S. Magner, Gladys C. M. Marshall, John S. Matthews, Michael P. Moran, Maggie M. Nelson, John F. O'Connell, The O'Rourke, Francis E. Preston, William E. Rutledge, William Sherowitz, and Richard T. Taylor.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—At examinations held recently the following candidates were successful:—

FINAL DENTAL EXAMINATION.

Arnold Berman, Stephen E. Brown, Aaron Cornick, Joseph G. F. Delany, Ethel M. R. Eagleson, Thomas G. King, John A. Rourke, and Joseph Rubinstein.

PRIMARY FELLOWSHIP EXAMINATION.

Robert F. J. Henry, Lucy M. Joly, Alan J. Mooney, Arthur F. O'Carroll, Richard W. Power, Frederick H. Whyte, and Wilfrid E. C. Wynne.

FINAL FELLOWSHIP EXAMINATION.

Cornelius D. Dykman, Herbert Mackay, and Stephen A. McSwiney.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—Goldsmid Entrance Exhibitions of 112 guineas each have been awarded to Mr. P. M. D'Arcy Hart, Gonville and Caius College, Cambridge, and Miss Janet Vaughan, Somerville College, Oxford.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The vacation course in general medicine will begin on Monday, Sept. 11th, and continue daily for two weeks until Sept. 22nd. A short comprehensive course on tropical diseases will be given at the London School of Tropical Medicine, Endsleigh-gardens, N.W. 1, during October. Those desiring to take either course should notify the Secretary to the Fellowship at 1, Wimpole-street, London, W. 1.

ROYAL COLLEGES EXAMINING BOARD: NEW SYNOPSIS OF FORENSIC MEDICINE.—A revised synopsis of forensic medicine has been prepared by the examiners in medicine and is to come into force at the July examination in 1923. The synopsis is as follows:—

Privileges and obligations of medical practitioners. Medical registration. Medical certificates and notifications. Medical evidence. Dying declarations. Procedure relating to coroners' inquests.

Signs of death and the phenomena which follow death. Putrefaction in air. Putrefaction in water. Mummification. Formation of adipocere. Inspection of the dead body and post-mortem examination.

Medico-legal aspects of identification.

Modes of dying. Causes of sudden death.

Death from the following causes: Wounds and mechanical injuries. Hanging. Strangulation. Suffocation. Drowning. Electrical current and lightning. Starvation.

Indications of death from accident, suicide, or homicide. Methods of recognition of blood stains.

Poisoning.—Medico-legal duties of medical practitioners in cases of poisoning. Symptoms and post-mortem appearances produced by the common inorganic, organic, and gaseous poisons, and the treatment of the patient.

Methods of post-mortem examination in cases of poisoning, and reservation of parts of the body for analysis.

Simple tests for common poisons. The sale of poisons.

Medico-legal questions relating to pregnancy, delivery, rape, criminal abortion, infanticide.

The Lunacy Laws in so far as they affect the medical practitioner in relation to the signing of certificates of lunacy.

MANCHESTER ROYAL INFIRMARY NURSES.—A bazaar will be held on the first three days in November with the view of raising £10,000 towards a sum of £100,000 required to build a nurses' home for the Royal Infirmary. The new infirmary, built 13 years ago, provided accommodation for 189 nurses, but with the increased work of the institution many members of the nursing staff now have to be accommodated outside. The board of management is hoping to be in a position to reduce the hours of the nurses, which at present are 73 hours per week when on night duty, and when on day duty 63 hours per week—a weekly labour which, it is agreed, is too long. A uniform week of 56 hours for both day and night duties is aimed at. To this end at least 65 more nurses are needed, and in order that the whole nursing staff should be accommodated under one roof the above-mentioned effort will be made. The appeal is made not only to Lancashire, but to the neighbouring and surrounding counties, which send many patients annually to the Royal Infirmary.

REUNION DINNERS.—*St. Bartholomew's* old students' dinner will be held on Monday, Oct. 2nd, in the Edward VII. Rooms, Hotel Victoria, Northumberland-avenue, at 7 for 7.30 P.M., Sir Charles O'Brien Harding in the chair. Decorations will be worn. Reply to Sir C. Gordon Watson or Mr. R. M. Vick, St. Bartholomew's Hospital College, London, E.C.

The annual dinner of the past and present students of *Westminster* Hospital will be held on Monday, Oct. 2nd, at the Wharncliffe Rooms, Hotel Great Central, at 7.30 P.M. Mr. Arthur Evans, M.S., F.R.C.S., will be in the chair. The secretary is Dr. Adolphe Abrahams, 17, Harley-street, London, W. 1.

At the *Middlesex* Hospital Medical School the introductory address of the winter session will be delivered by Prof. Sidney Russ, at 3 P.M., on Tuesday, Oct. 3rd, after which prizes will be distributed by H.R.H. Princess Alice. The annual dinner will be held the same evening at 7.30 P.M., at the Trocadero, when Mr. W. Sampson Handley will preside. Those wishing to be present should communicate with the secretary-superintendent of the hospital.

The winter session at *St. George's* Hospital will commence on Oct. 2nd, when the introductory address will be delivered in the large lecture theatre at 3 P.M. by Sir Clifford Allbutt. The annual dinner of past and present students will be held at the New Metropole Hotel at 6.30 for 7 P.M., Sir Sydney Russell-Wells, M.D., in the chair. Mr. R. R. James and Mr. L. Colledge are acting as secretaries to the dinner, and intimations of intention to be present should be sent to one or other at the hospital.

Surgeon-General W. Budd Slaughter, A.M.S. (retd.), has been elected Master of the Society of Apothecaries.

LITERARY INTELLIGENCE.—Mr. Henry Kimpton announces the following forthcoming publications: "Pulmonary Tuberculosis," by Dr. Maurice Fishberg; "Diseases of the Thyroid Gland," by Dr. A. E. Hertzler; "Applied Orthodontia," by Mr. J. D. McCoy; "Dental Surgery: Questions and Answers for Dental Students," by Messrs. Wesley and Alfred Templar Barritt; "Symptoms of Visceral Disease," by Dr. Francis M. Pottenger; and "The Physiological Feeding of Infants and Children," by Dr. Eric Pritchard.

STAR AND GARTER HOME.—This home for disabled sailors and soldiers, established and hitherto managed by the British Red Cross Society, has been constituted an independent charity under a scheme prepared by the Charity Commissioners. Under its new constitution the charity will be administered by a body of governors comprising the former members of the committee, with Sir Arthur Stanley as chairman and Sir William H. Bennett as vice-chairman. The appointment of additional governors is vested in the British Red Cross Society.

BRIGHTON AND ALEXANDRA ROSE DAY.—Alexandra Rose Day in Brighton, Hove, and district realised £1155 2*s.* 7*d.*, and after allowing for all expenses the sum of £900 has been allocated as follows: Royal Sussex County Hospital, £330; Brighton, Hove, and Preston Dispensary, £90; Royal Alexandra Hospital for Children and Brighton and Hove Hospital for Women, each £85; Lady Chichester Hospital, the New Sussex Hospital, and the Sussex Throat and Ear Hospital, each £60; Sussex Eye Hospital and the Brighton and Hove Nursing Association, each £40; Royal Surgical Aid Society, £20; Clayton and Keymer Nursing Association, £10; and the Brighton and Hove Provident Dental Hospital, Lindfield Nursing Association, Henfield Nursing Association, and Lewes Hospital, each £5. Hospital Saturday at Brighton brought in £317 11*s.* 4*d.*

MIDDLESEX HOSPITAL: THE CANCER CHARITY.—The report of this charity for the year 1921 states that the year started with 87 patients, and that during the year 505 patients, comparing with 302 in 1920, were admitted, 76 remaining in the wards at the end of the 12 months. The occupancy per bed per diem in 1921 was 85·74, and in 1920, 87·05. In the out-patient department 234 new cases were treated, and the number of attendances was 789, the corresponding figures for the previous year being 188 and 832 respectively. The income and expenditure account shows an increase over last year on both sides. With income at £18,608, being £2023 higher, and expenditure at £21,460, £2733 higher, the deficit this year is £2852, compared with £2142 or £710 greater. Annual subscriptions at £1190 are £219 higher, and the grants from the three central funds give an increase of £616. A new source of income—namely, contributions by in-patients towards maintenance, amounts to £1383 and by out-patients to £30.

DONATIONS AND BEQUESTS.—The late Mr. Alfred Price, of Daleham-gardens, Hampstead, left by will £1000 to the University College Hospital and £500 each to the Stoke Newington Dispensary and St. John's Hospital for Diseases of the Skin.—By the will of the late Mr. Arthur Daniel Serena, J.P., of York-terrace, Regent's Park, about £250,000 will be divided equally between certain charitable institutions, including the following hospitals: London, Charing Cross, King's College, Guy's, Middlesex, University College, Royal Free, St. Bartholomew's, St. George's, St. Thomas's, St. Mary's, Royal Northern, Royal Hospital for Incurables, Poplar Hospital, Hospital for Consumption and Diseases of the Chest, Brompton Cancer Hospital, Chelsea Hospital for Women, Queen Charlotte's, Hospital for Sick Children, Lock Hospital and Rescue Home, Harrow-road, and Italian Hospital, Queen-square, Dr. Barnardo's Homes, Royal School for Deaf and Dumb Children (Margate), and the Incorporated Association for Promoting the General Welfare of the Blind.—By the will of Miss Ellen Constance Kemp, of Old Falinge, Rochdale, Lancs., the testatrix left £1000 to the Medical Mission Auxiliary; £200 each to the Hospital at Tai Yuan Fu and Dr. Barnardo's Homes; £100 each to Rochdale Infirmary and the Mission to Lepers.—The Chelsea Hospital for Women has received a donation of £27 from the Robert William Edwards Trust.—The Manchester Children's Hospital during the last month has received £2451, including a donation of £1000 to endow "The Law Binns Cot" and £1000 to endow "The R. N. Hudson Cot." The late Mr. E. H. Cookson, of Liverpool, made bequests of £1000 each to the Royal Southern Hospital, Bluecoat Hospital, Seamen's Orphanage and Homes for Ancient Mariners (Egremont); £500 to the Royal Infirmary, David Lewis Northern Hospital, and £200 to the Infirmary for Children and the Dental Hospital.

MANCHESTER MEASLES EPIDEMIC.—For the week ending August 19th 385 fresh cases of measles with 12 deaths were reported. In the corresponding week of last year there were only 10 cases.

THE LATE DR. J. M. PERCIVAL.—The death occurred on August 8th at Shopwyke, Chichester, of Dr. Joseph Mumford Percival. For many years he had lived in retirement, but was formerly a well-known medical practitioner in the city and district. He was educated at University College, London, and became a Member of the Royal College of Surgeons of England in 1855, securing the L.S.A. diploma in the same year. At Chichester he held a number of appointments, among them that of regimental doctor at the depôt of the Royal Sussex Regiment. He was at one time surgeon-lieut.-colonel of militia. He died in his eighty-ninth year.

A PROSECUTION FOR SALE OF DEFECTIVE MILK.—At Shoreham petty sessions, on August 14th, a Partridge Green dairy farmer was mulcted in a penalty of £20 for selling milk deficient in fat. Although a churn was labelled "Pure new milk," an analysis of the contents showed a 17 per cent. deficiency in fat and a 10·4 per cent. deficiency in non-fatty solids, the sample also showing that the milk was both skimmed and watered. From evidence stated on oath it appeared that the farmer's son put some water in the churn to keep the latter cool, and when the time came for the churn to be filled with milk, forgot to pour out the water. The son admitted such a happening on three separate occasions "as he was in a hurry to go to cricket." In imposing the penalty stated, the chairman of the bench (Mr. W. A. Hounsom) said it was an extremely serious case, which from the ethical standpoint must be very seriously marked, because the reputation of a tradesman had been placed in peril by the delivery of bad milk. The case arose in consequence of a sample being taken at Shoreham from the retailer; samples taken at Partridge Green by an inspector showed the milk to be very good. The father stated on oath that the water was not put into the milk on his authority and characterised its discovery as the biggest surprise of his life. The chairman of the bench emphasised the fact that the son ought to pay every penny of the penalty.

BARROWMORE TUBERCULOSIS COLONY.—The colony at Barrowmore Hall, near Chester, instituted by the East Lancashire Joint County Committee of the Red Cross and St. John, has gradually been developing since March, 1921, and now contains 60 men for training and treatment. At the outset the Ministry of Health urged the rapid provision of 210 beds, promising on completion a capital grant of £37,800. The Central Joint War Committee of the Red Cross voted £70,000 towards the enterprise and some £15,000 was collected locally in East Lancashire. Unfortunately under the economic proposals of the Geddes Committee the Treasury grant was reduced in October last to £7500. The Red Cross Committee is thus faced with a difficult position. The Ministry of Health does not sanction extension of the colony beyond the 60 places now occupied, although the public rooms have all been adapted for the larger scale. The Committee is determined that even on a small scale it will make the scheme complete by providing permanent settlement for some of the men. With this in view a million shilling fund has now been launched, from which money should be available to complete the scheme. The results so far achieved have been encouraging, and suggest to those in charge of the colony that the one satisfactory solution to the problem of the tuberculous man is to plan for his complete life rather than discharge him at the termination of the period of training.

ROYAL MEDICAL BENEVOLENT FUND.—At a recent meeting of the committee 37 cases were considered and £477 voted to 35 applicants. The following is a summary of some of the cases relieved:—

Widow, aged 70, of M.R.C.S. Eng. who practised in Cheshire and died in 1897. Applicant and her daughter are living in furnished rooms, as they have let their house furnished for £3 3*s.* per week. The house has now to be given up, and the only source of income is £50, the daughter's salary as a governess. The furniture will have to be sold, as they cannot afford to store it. Voted £18 in 12 instalments.

Daughter, aged 56, of M.R.C.S. and L.R.C.P. who practised in Exeter and died in 1908. Applicant has earned her own living as a companion, but owing to ill-health has had to give up her occupation. She is now in the Nightingale Hospital, and asks the Fund to help her. Her only income is from the Health Insurance. Voted £18 in 12 instalments.

Daughter, aged 31, of L.R.C.S. who practised in London and died in 1901. Applicant's mother has just died, and she is asking the Fund to help her with the doctor's bill and expense of the funeral. Voted £3 13*s.* 6*d.* towards doctor's account.

Daughter, aged 58, of L.S.A. and M.R.C.S. who practised in London and died in 1913. Applicant was formerly a governess, but gave this up in order to look after her mother and attend to the home. Her father left her £200, and she has been living upon this, but it is nearly spent. Rent 3*s.* per week. Voted £18 in 12 instalments.

Widow, aged 53, of M.R.C.S. Eng. who practised at Stockton-on-Tees and died in 1920. Applicant has been supported by her eldest son who has just died quite suddenly. She has had to borrow £15 for funeral and other expenses connected with his death, and asks if the Fund can help her. She pays 30*s.* per week for partial board, and her only income is £70 from the Widows' and Orphans' Fund, and 10*s.* a week allowed by her son who is a clerk. The daughter is only able to support herself. Voted £15.

Subscriptions may be sent to the hon. treasurer, Sir Charters J. Symonds, at 11, Chandos-street, London, W. 1.

BRITISH ASSOCIATION AT HULL.—A large attendance is expected at the ninetieth annual meeting which assembles next week. Sir Charles Sherrington's presidential address on Sept. 16th will deal with Some Aspects of Animal Mechanism. The section of physiology will meet jointly with the section of agriculture to discuss Vitamins, with the section of economics to consider the Possibility of Increasing the Food-supply of the Nation, and with the section of physical science to agree on the Construction of Instruments used for Biological Purposes. As is natural at an important North Sea port the subject of Marine Biology will take a large place at the meeting, representatives from the Scandinavian countries attending.

DEATH OF DR. STEPHEN SMITH OF NEW YORK.—The death is reported from New York on August 26th of Dr. Stephen Smith, founder and first president of the American Public Health Association. Professor of clinical surgery in N.Y. University, editor of the *N.Y. Medical Times*, author of surgical and medico-ethical handbooks, member of the National Board of Health, Commissioner in Lunacy—to mention only a few of his activities, Dr. Smith was one of the most versatile personalities which the medical profession has produced. He just failed himself to complete the 100 years of life, the possibility of attaining which he had devoted his later years to proving.

Appointments.

CAMERON, S. J., M.B., Ch.B. Glasg., F.R.F.P.S. Glasg., has been appointed Gynæcologist to the Western Infirmary, Glasgow.

GRIFFITH, T. V., M.B., B.Ch., B.A.O., Junior House Surgeon, Warrington Infirmary.

MIDDLEMISS, K. C., M.B., Ch.B. Glasg., Medical Superintendent, Monsall Hospital, Manchester.

Certifying Surgeons under the Factory and Workshop Acts: PATERSON, M. W., M.R.C.S., L.R.C.P. Lond. (Hyde, Cheshire); CROUCHER, F. B. (Oxted, Surrey).

Vacancies.

For further information refer to the advertisement columns.

Bootle County Borough.—Asst. Sch. M.O., &c. £600.

Bristol Eye Hospital.—H.S. £150.

Bristol Royal Infirmary.—Asst. Anæsth. £100.

Burnley County Borough.—M.O. for Ven. Dis. £850.

Cambridge Mental Hospital, Fulbourn, near Cambridge.—Sen. Asst. M.O. £400.

Cardiff, King Edward VII. Hospital, Ear, Nose and Throat Department.—H.S. £150.

Carlisle, Cumberland Infirmary.—Res. M.O. £175.

Derby County Asylum.—Med. Sup. £1000.

Exeter, Royal Devon and Exeter Hospital.—H.P. £150.

Fareham, Hants, Knowle Mental Hospital.—Third Asst. M.O. £300.

Hastings Union.—Res. M.O. £450.

Hereford Victoria Eye and Ear Hospital.—Hon. Ophth. and Aural Surg.

Ipswich, East Suffolk and Ipswich Hospital.—H.S. £150.

Lancaster County Asylum.—Asst. M.O. £300.

Manchester Children's Hospital.—Asst. M.O. £200. Res. M.O. £150. Res. S.O. £100.

Manchester Royal Infirmary.—Hon. Asst. S.

Middlesex Hospital, W.1.—Surg. Reg.

Newcastle-upon-Tyne, Durham College of Medicine and the Royal Victoria Infirmary.—Jun. Asst. £400.

Northampton, St. Andrew's Hospital for Mental Diseases.—Second Asst. M.O. £400.

Queen Mary's Hospital for the East End, Stratford, E.—H.S. £150.

Royal Chest Hospital, City-road, E.C.—H.P. £100. Res. M.O. £200.

Royal Free Hospital, Gray's Inn-road, W.C.—First and Second Assts. to M.O. £200 and £100 respectively. Also Med. Reg. £100

Royal Northern Hospital, Holloway, N.—Anæsth. £10 10*s.* H.P. £150.

St. Mary's Hospital Medical School, Paddington.—Lab. Research Worker. £500.

Tunbridge Wells General Hospital.—H.S. £160.

West End Hospital for Nervous Diseases, Welbeck-street, W.1.—Hon. M.O. for Elec. Dept.

West London Hospital, Hammersmith-road, W.—Non. Res. Cas. O. £5 5*s.* per week. Also H.P. and Two H.S.'s. £100 each.

Worcester General Infirmary.—Res. M.O. £200.

York City and County Borough.—Female Asst. M.O.H. and Asst. Sch. M.O. £500.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments:—Cleobury Mortimer (Salop), Patterdale (Westmorland), Pontardawe (Glamorgan), and Longtown.

Births, Marriages, and Deaths.

BIRTHS.

BLAKE.—On August 22nd, at Wade Cottage, Havant, to Marjorie, wife of Philip Blake, L.D.S. Eng., of a daughter.

DRURY.—On August 23rd, at Canfield-gardens, N.W. 6, to Daphne, wife of Alan N. Drury, M.D., of a son.

GWYNNE HOWELL.—On August 26th, at a nursing home, to Gertrude, the wife of Lieut.-Colonel F. D. Gwynne Howell, D.S.O., M.C., R.A.M.C., of a daughter.

RENTON.—On August 21st, at London-road, St. Leonards-on-Sea, the wife of R. Stuart Renton, M.C., M.D., of a son.

STUART-TAYLOR.—On August 26th, in Hong-Kong, to Evelyn (*née* Calvert), wife of Sir Eric Stuart-Taylor, Bart., M.D. Camb., of a daughter.

THOMSON.—On August 24th, at Brondesbury-road, Kilburn, to F. Hilda, M.B., B.S. Lond., wife of C. de B. Thomson, L.M.S.S.A. Lond., of a daughter.

DEATHS.

BIRD.—On August 27th, at Margate, Matthew Mitchell Bird, M.D. Durh., M.R.C.P. Lond., M.R.C.S. Eng., aged 70 years.

CARRINGTON-SYKES.—On August 25th, at his home, Matthew Carrington-Sykes, M.D., F.R.C.S.E., of Maynard Tower, Hemel Hempstead, and of 50, Brook-street, W. 1, aged 63. Buried at the Cemetery, Barnsley (Yorks) on Thursday, August 31st.

LAWDER.—On August 24th, at Blakesley-avenue, Ealing, Edward John Lawder, L.R.C.S.I. and L.M., aged 73 years.

STEVENS.—On August 20th, at Gaya, India, from cholera, Lieut.-Colonel Algernon Francis Stevens, M.R.C.S., L.R.C.P. Lond., I.M.S.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1922.

THE Index and Title-page to Vol. I., 1922, which was completed with the issue of June 24th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

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POSITION PAGES.—Terms on application.

Notes, Short Comments, and Answers to Correspondents.

THE NECESSITY FOR THE COÖPERATION OF THE MEDICAL AND VETERINARY PROFESSIONS.[1]

BY FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S. EDIN.,

FORMERLY PROFESSOR IN THE ROYAL VETERINARY COLLEGE, LONDON.

THE question of the value of the study of comparative medicine and a closer comparison between human and veterinary medicine has received a deal of attention lately, and its importance cannot be overestimated, for we have in our midst a number of known diseases (and probably others not yet understood) communicable from animal to man. Of these diseases we have, in Great Britain alone, at least the following: glanders, rabies, tuberculosis, anthrax, foot-and-mouth disease, trichinosis and other parasitic forms which require an animal host before they can complete their life-cycle; certain forms of mange and ringworm, and possibly pyorrhœa (so common amongst pet dogs); whilst the danger of the animal as a carrier and spreader of disease must not be underestimated, especially in relation to home pets whose domesticated habits bring them into close contact with children and invalids.

In this paper I am going to confine myself entirely to glanders, rabies, and tuberculosis. I decided upon this course after reading in a Paris newspaper a description of a recent happening in Russia. The paragraph, based upon a despatch from Helsingfors, ran as follows:—

"The Soviet Red Gazette announces that the Bolshevist authorities in one of the famine districts 'for humanitarian and sanitary reasons' have shot 117 children afflicted with glanders which developed after eating the flesh of horses suffering from that complaint."

I selected rabies because this disease, after having been stamped out of Great Britain for over 20 years, again made its appearance amongst us a few years ago, and has only been controlled by the skill and foresight of the Veterinary Department of the Ministry of Agriculture. A recent newspaper report states that "more than 450 human beings are being treated at the Pasteur Institute, Constantinople, for bites by mad dogs. A campaign for the wholesale destruction of dogs is being organised, but it is being found very difficult to capture them." These are two of the most horrible diseases the medical profession has had to face in the past, and, although Pasteur treatment has deprived rabies of its terror, glanders means certain death; I believe that only one man now living can claim to have recovered from this disease—I refer to Prof. Gaiger, the Principal of the Glasgow Veterinary College. Glanders and rabies come originally from animals, and if stamped out in animals, disappear inevitably as diseases of man.

Glanders.

Twenty-five years ago scarcely a stableman amongst the cab and omnibus yards of London and other large cities but knew the name "glanders"; but now, thanks to the progress of modern veterinary science, not only do such men not know its name, but not 1 per cent. of medical men in Great Britain have ever seen a case, or would suspect such a diagnosis, even with the patient in front of them. On two occasions in years gone by, when holding the position of London County Council Veterinary Inspector for a West End district of London, I saw post-mortems on two men who had died of this disease, and in neither case was it diagnosed until just before death. One had been treated for ten months for chronic rheumatism, and the other for chronic pleurisy. This disease is one of the few in which we, in our profession, have an advantage over our human confrères; by the proper use of mallein we can within 48 hours, at any time, and with absolute certainty, tell a client whether his animal is, or is not, the subject of glanders. In 1901 some 2370 animals were killed under the Glanders Order in Great Britain, and at that time the notified deaths amongst human patients averaged four or five annually. Although, I understand, one case has been reported this year, I believe glanders in man is practically extinct, and by the end of the present year we hope to say the same about glanders in the horse. In 1920 only 15 outbreaks occurred, involving 22 animals, and up to the present—i.e., 24 weeks of this year—no instance in the horse has yet been reported.

[1] Abstract of a paper read before the Lewisham Division of the British Medical Association.

In dealing with an outbreak of glanders the veterinarian has an advantage over the practitioner in human medicine, for in this country the latter will never adopt the drastic Bolshevist method.

Imagine an outbreak of glanders in a stud of horses. A report is made to the veterinary official in charge that a horse or mule has a suspicious nasal discharge, or that a chain of farcy buds (some perhaps discharging) has appeared in some part where the lymphatics are plentiful and superficial; or an animal may be persistently a bad doer—i.e., feeds well but is emaciated in appearance, harsh and dull in coat, and thin; perhaps passing an abnormal amount of urine and having a slightly abnormal temperature. Mallein, a preparation made from the organism of glanders, is either injected intradermally in the lower eyelid, or hypodermically in the loose subcutaneous tissue in the region of the centre of the neck, and in the event of the disease being present, a painful swelling appears, which persists for some hours after the injection is made, and is usually at its height some time between the twenty-fourth and forty-eighth hours; after which, if the patient is allowed to live, it will gradually subside. A certain amount of constitutional disturbance takes place. A graded rise of temperature (the normal temperature of the horse averages 100·4° F.) to 103·5° or 104°, or perhaps even 106° is confirmatory to the local swelling that the patient is glandered. With the aid of mallein, glanders was completely eradicated from British army horses during the last war, and some 150,000 horses were afterwards sold in Great Britain, but not a single complaint of the occurrence of glanders, from this source, has been heard. The symptoms of glanders in a horse and the ravages this disease makes in the tissues are well shown in the classical volume on the subject by the late Mr. Wm. Hunting, Chief Veterinary Inspector to the London County Council, whose painstaking work did much to eradicate the disease from London. With regard to communication of the disease, a sticky, and perhaps blood-stained, discharge, accompanies the nasal manifestations, the smallest quantity of which has only to obtain access to the freshly abraded surface of a man's skin—either by direct contact when sponging out the nostrils or by being sneezed upon—to give every chance of infection. Everyone knows the carelessness of the average men employed in England in a cab or small contractor's stable; it is no uncommon thing for them to eat food after sponging out the nostrils, without washing or even rinsing their hands. The danger is not confined to stablemen. In Berkshire, just before the war, a young lady contracted the disease through taking pity upon a gipsy's pony suffering from what she thought was a cold. She purchased the animal and made a pet of it, the nasal discharge being afterwards proved to be that of glanders. We have no treatment to effect a cure. Vaccines and all kinds of drugs have been used in vain; it has been found post mortem that a natural cure may sometimes be effected, but we cannot afford to run risks; we prefer slaughter and the stamping-out system, the owner being compensated according to the amount fixed by law. All in-contact animals are tested with mallein, and if they react are slaughtered forthwith, and for a necessary period of time the rules of quarantine are enforced. Stables and other premises are disinfected; tools, rugs, and wooden buckets are disinfected or destroyed, and in this way an owner may, after a few days, safely replace his stock and start again.

Rabies.

Rabies, a disease chiefly of the dog, is not necessarily confined to that animal; it may be met with in the horse, cow, sheep, pig, and even in the domesticated fowl. Stamped out of Great Britain over 20 years ago, its reappearance was signalled shortly after the recent war by a rabid dog being found at Plymouth in May, 1918; in 1919, 143 cases of rabies were confirmed—140 in dogs, 2 horses, and 1 pig. Possibly it was brought to England by aeroplane, or landed from a ship. During 1919 alone 179 persons were bitten by animals, 46 of which were rabid. Fortunately, owing to the work of Pasteur, and the excellent arrangements made by the Ministry of Health, there have been no human deaths, and the disease was not spread broadcast. More certain research in connexion with rabies has been made of late years, and by the microscopical discovery of the Negri bodies in the brain of a suspected case, much valuable time can now be saved, so that one does not have to await the result of inoculation experiments to verify a diagnosis. One recent case was reported in a dog—again in the South, near a port; but the returns of the Ministry of Agriculture show that up to June 3rd this year one dog only has been rabid, and I think we can assume that England will shortly again be declared free from this disease.

Tuberculosis.

Tuberculosis is to us, as with you, the most important and devastating disease of the day; here, as with the other two diseases, the two professions must work together; in so far as the bovine form is concerned, the veterinarian may again be given the place of honour in the front trench; in a recent discussion upon the subject before the Royal Society of Medicine (a meeting combined with the Central Branch of the National Veterinary Association), Dr. C. A. Inman stated that no less than 85 per cent. of the cases of tuberculosis of the glands of the neck occurring in children were of bovine origin—a terrible reflection on the unclean and infectious character of our milk-supply. One cannot understand why legal measures are so long delayed, and why the Cattle Tuberculosis Order, which was really making headway in 1912 and was suspended during the war, has not been re-established. The report of the Medical Officer of Health for London (Dr. W. J. Howarth) for 1921 states that out of 50 consecutive samples of milk purchased in the City of London no less than one in four proved to be tuberculous; and Dr. Biggar, at the last meeting of the Statistical and Social Society of Ireland, asserted that 6 per cent. of all deaths from tuberculosis were due to drinking tuberculous milk. Given a free hand, we of the veterinary profession could stamp out tuberculosis of cattle in the same way as we have stamped out glanders and rabies. It would take time and would cost money, but would save an annual loss of 10,000 human lives. At the present moment a method of immunisation of calves, introduced by Dr. Nathan Raw, M.P., is on trial. Should it prove successful, it will be one of the greatest boons ever conferred upon agriculture, and through agriculture to mankind—for it will very materially help to eradicate the disease.

I think I have proved the great necessity for more earnest collaboration between our two professions; given the means and the power to carry out our duties successfully, then, of the three diseases I have discussed, two will become unknown, and the third only needs to be grappled with in earnest to be relegated to the background with the less important communicable diseases.

ELECTRICAL INSTRUMENTS OF NEW DESIGN.

WE have received from Messrs. Watson and Sons, of Sunic House, Kingsway, copies of their Bulletins 438, 458, and 468, describing clearly certain electrical instruments of new design. In the first is a description of an instrument called the "Ionostat," designed for obtaining from the main a current of reduced voltage suitable for direct application to the body. The reduction is effected by leading the main current first through a resistance lamp and then through a receptacle containing water by way of two electrodes immersed in the latter. The patient is connected to a separate pair of electrodes immersed in the water. These are permanently fixed in a position in which they are at the same potential so that no current can pass to the patient. A plate of insulating material is mounted in position in the water and attached to a movable handle. While the latter is rotated to either side of a zero position a gradually increasing difference of potential is established between the electrodes which are connected to the patient. A gradually increasing current therefore passes through the patient and its direction depends upon the side of the zero position to which the handle is rotated. The advantages of using water as a shunt resistance are the perfectly even increase or decrease in the current which the patient receives, the ease with which the direction of the current can be changed, and the freedom of risk to the patient. The Ionostat possesses the additional advantage that all the parts of the instrument which convey current are permanently fixed in position. The only movable part is the insulating plate, and this contains no wires or terminals. The water is contained in a non-fragile receptacle from which it cannot leak when the latter is closed and the apparatus ready for use. The over-all measurements are 12 in. by 9 in. by 10 in. high and the apparatus is portable. It can also be used for the illumination of exploring lamps and the current which it yields will also operate medical induction coils. Messrs. Watson and Sons will send this apparatus for trial, free of all expense, to any address in Great Britain, on receipt of a professional card, so that those who are interested in electro-therapy can give it a trial.

Bulletin 468 contains a description of a new intensifying screen which has a waterproof surface without the addition of varnish or other waterproof material, and it is claimed that its speed is not thereby diminished. For use with duplitised X ray films two intensifying screens are made. Of these the back screen has the normal thickness and the front one allows the X rays to pass with the minimum hindrance.

Bulletin 158 deals with instruments which have been devised for measuring X ray dosage. One of these, the "Ionometer," measures the dosage by means of the rate of fall of one of the leaves of an electroscope which has previously been charged. The ionisation chamber upon which the X rays impinge is tubular in shape and measures 30 mm. in length by 15 mm. wide. It can, if desired, be placed within some of the body cavities so as to measure the dosage for internal growths. It is connected with the electroscope

by means of a conductor two metres long provided with a flexible end for attachment to the ionisation chamber. Another instrument is described which measures the intensity of X rays by means of the alteration in the resistance of selenium when the latter is placed in the path of the rays. In order that the dosage at any given depth below the skin may be ascertained the "Waterphantom" has been devised. This is a vessel containing water and provided with a capsule in which the receiver of the intensimeter is placed. By means of a rack-and-pinion adjustment the capsule is lowered to a depth in the water corresponding to the distance below the skin at which the growth requiring treatment is situated. As water has the same penetrability as the soft tissues, the length of exposure necessary at any depth below the skin can be ascertained after a preliminary trial with the "Waterphantom."

GOATS AND EPIZOOTIC ABORTION IN CATTLE.

To the Editor of THE LANCET.

SIR,—I am told of a custom here in South Devon of putting goats to run with cows to prevent epizootic abortion in the latter. It may be Pan magic, but so many of these empirical tricks have been shown to have a rational basis that one recalls at once that goats are the natural reservoir of Malta fever, and that the *Bacillus abortus* is (almost) indistinguishable from the *Micrococcus melitensis*. Is it possible that contact with the goats vaccinates the cows against abortion? Further information about the practice would be interesting.

I am, Sir, yours faithfully,

Branscombe, August 23rd, 1922. A. E. BOYCOTT.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Will you allow us to make a very urgent appeal for funds to send working girls and women away for a short holiday? Many of those who are hoping to go during the next few weeks have never slept out of London for a single night. Our funds are exhausted, but we have many anxiously hoping for at least a week during the autumn.

The need for this little rest and change is probably more urgent than ever before. Trade depression has resulted in the girls being the main support of thousands of families, who but for their earnings would be on the verge of starvation. The general standard of comfort in the average home is lower than it has been for many years, and the health of the community in the crowded and airless factory districts of London has deteriorated considerably. Nor has it been possible for the girls to save as much towards a holiday as they have done in former years. Good food, rest, and fresh air for a short time will make it possible for many to continue their work through the winter, who would otherwise break down under the strain and privation they have had to bear for so many months. The short holiday will give them fresh hope and courage. The committee feel that they cannot refuse those who are still hoping to go without first making a very urgent appeal to the general public.

Subscriptions and donations will be thankfully received and acknowledged by the chairman of the executive committee, Mr. J. F. Green, M.P.; or Miss Canney, 75, Lamb's Conduit-street, W.C. 1.

We are, Sir, yours faithfully,

ALBERTA SANDWICH, FRANK LLOYD,
HENRY STEPNEY, ROBERT F. HORTON,
LOUISE CREIGHTON, J. H. HERTZ.
MARY SCHARLIEB,

August 21st, 1922.

THE CARMARTHEN JOINT MENTAL HOSPITAL.

SUCH adverse criticism as is suggested by the report of the Carmarthen County Mental Hospital for 1921 only serves to illustrate the main thesis of a leading article in THE LANCET of August 12th—namely, that the obstacle to nearly all feasible improvements in administration is the ratepayers' demand for economy. In this institution the immediate needs appear to be for a less monotonous diet, the services of a dental surgeon, a more liberal supply of books (such as are available at present being furnished by charitable effort from outside), more overcoats, better heating apparatus, and modern sanitation. In the interests of economy the working hours of the nurses and attendants have been increased from 48 to 60 per week. It would be interesting to know what proportion of this time is devoted to "social" as distinct from actual nursing work, and whether this distinction is made, as suggested in the report of the Committee on Asylum Administration. The recovery rate is good—viz., 41 per cent. It is disquieting to note that 32 of a total of 73 deaths occurring during the year were due to tuberculosis, and that 9 cases of active tuberculosis are at present in the institution. It does not appear from the report whether any measures are taken to segregate these patients.

DANGEROUS DRUGS RECORDS.

WE have received from Messrs. Suttley and Silverlock, Ltd. (medical printers, Blackfriars-road, London, S.E. 1), a copy of the "Suttlock" Register for use by doctors and pharmacists who have to make purchases and sales under the Dangerous Drugs Act of 1920. The book contains a handy summary of the relevant sections of the Act, the regulations for hospitals and institutions, along with the special authorisations and exemptions. The register itself is divided into five parts, dealing respectively with the purchase and sale of (1) raw opium; (2) morphine, &c.; (3) diamorphine (heroin), &c.; (4) cocaine, ecgonine, &c.; (5) medicinal opium. A number of pages are allocated to each of these records, to which a thumb-index gives convenient access. The price of the register is 7*s.* 6*d.*—Messrs. Duncan, Flockhart and Co. (104–108, Holyrood-road, Edinburgh) have issued a four-page folder giving the salient points of the regulations imposed by the Act, along with directions for dispensing prescriptions. The card will be posted to any reader who expresses his desire to have one for reference.—The *Chemist and Druggist* (42, Cannon-street, London, E.C. 4) has printed and copyrighted a useful card summarising the regulations of the Act as they apply to prescribers, and setting out clearly the limits of dilution which bring any prescription within the scope of the Act.

FINGER-PRINTS AND SWEAT-PORES.

STUDY of the sweat-pores or "poroscopy" is the latest development of dactylography, and is now being used to defeat the ingenuity of criminals who employ forged finger-prints, as the sweat-pores cannot be imitated by rubber stamps. Mr. J. C. Goodwin deals with the subject in the current issue of *Dactylography*, and a French correspondent of the *Manchester Guardian*, dealing with Modern Methods of Crime Detection, mentioned the use of poroscopy by criminal investigators in France. As Dr. Henry Faulds points out in the same issue of *Dactylography*, when an impression of the finger is taken in ink the furrows remain white, while the ridges show black, the sweat-pores revealing themselves as white dots. Ink is apt to clog their openings, and he finds that Mr. Leslie Dunton White's method of printing on collodion self-toning printing-out-paper gives a truer record of the size and shape of the sweat-pores. Mr. White's method was described in THE LANCET of Sept. 17th, 1921, p. 635.

Skin print taken on collodion self-toning photographic paper. Magnified 2½ times; inset actual size.

LA PUCELLE.

Dr. Barker Smith has published through Mr. A. J. Moore, of Norwood, at the price of 1*s.*, an historical ballad setting out the well-known story of the Maid of Orleans. The intention of the poem is to give readers an idea of the extensive gamut of voices and visions which came to Jeanne d'Arc, and stimulated her to proceed at various points in her marvellous and brief career. The free metre employed facilitates narrative, as no artificial restraint is put upon the flow of words, and the author suggests that by proper stressing the ballad will be found musical. In places we are left to wonder what are Dr. Barker Smith's historical authorities, but it is common knowledge that great differences of opinion in respect of the tradition of the Maid prevail among experts and archivists.

Poor Man.—We agree that any simple appliance which is alike cleanly and effective may take the place of the more expensive articles on the market.